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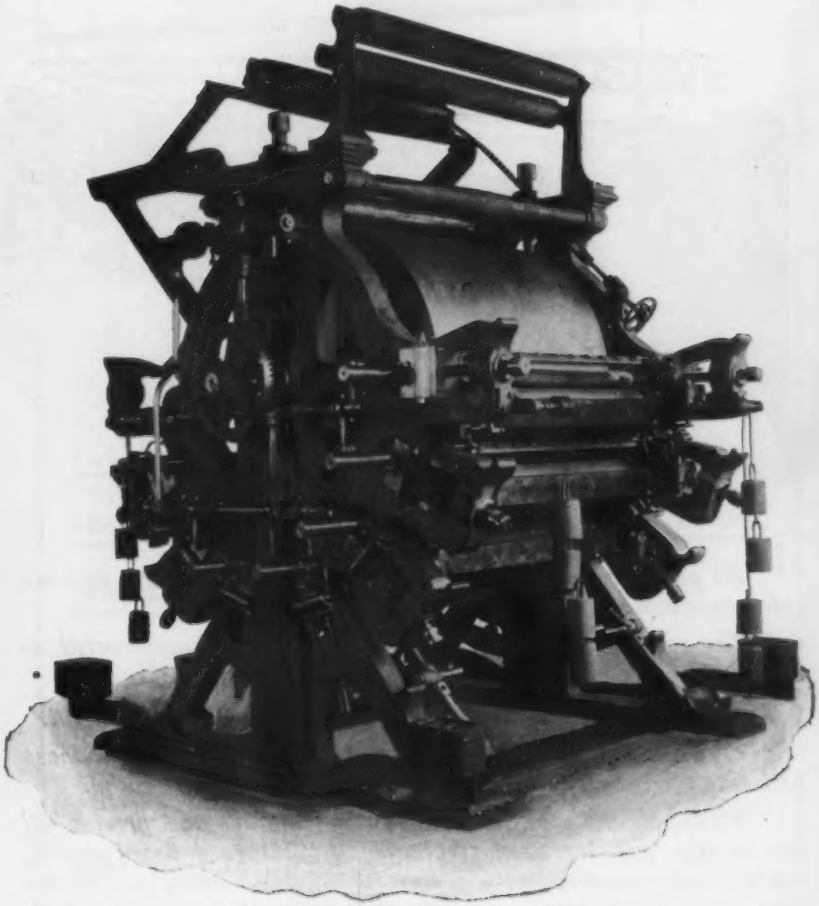

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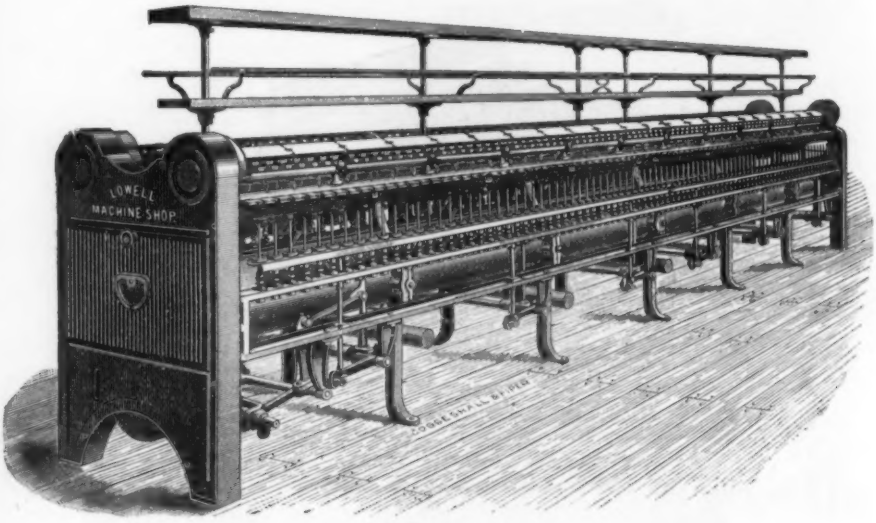

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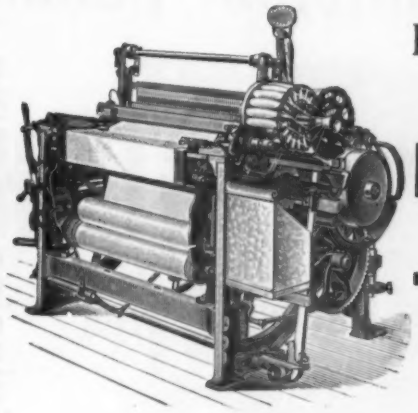

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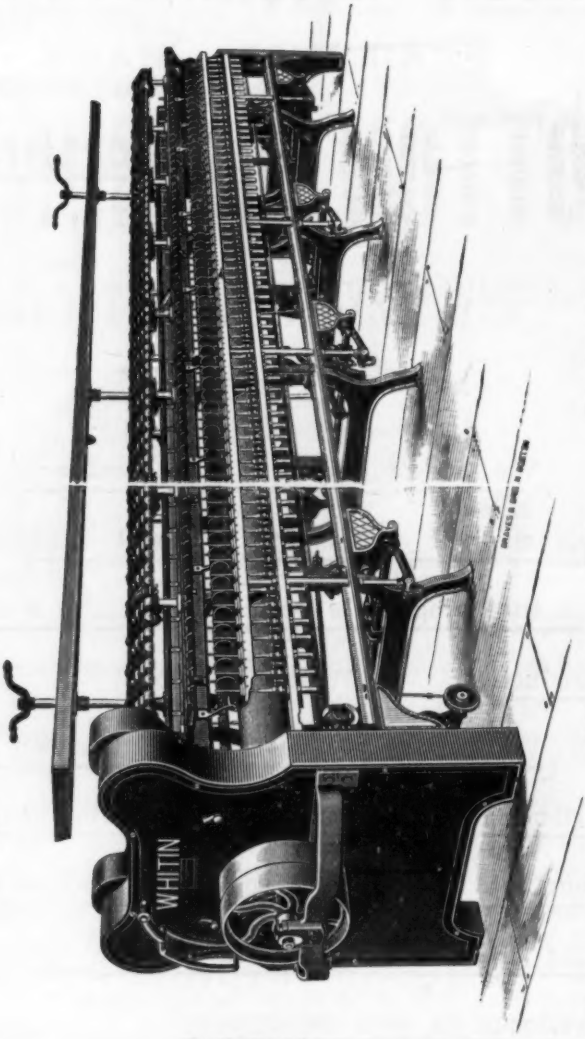

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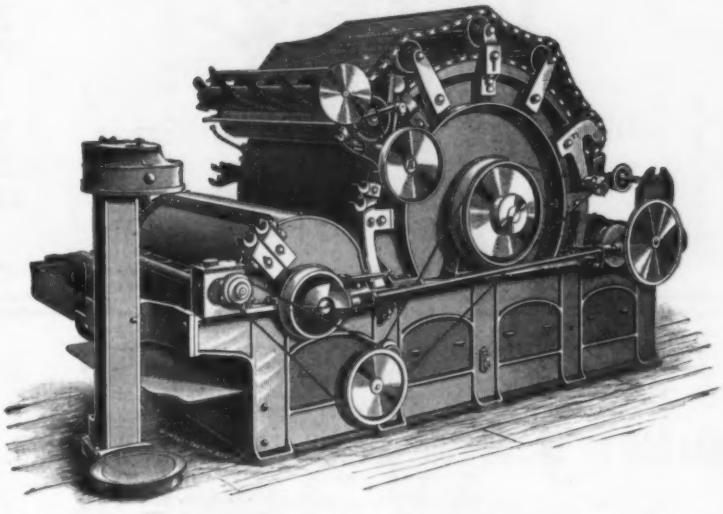

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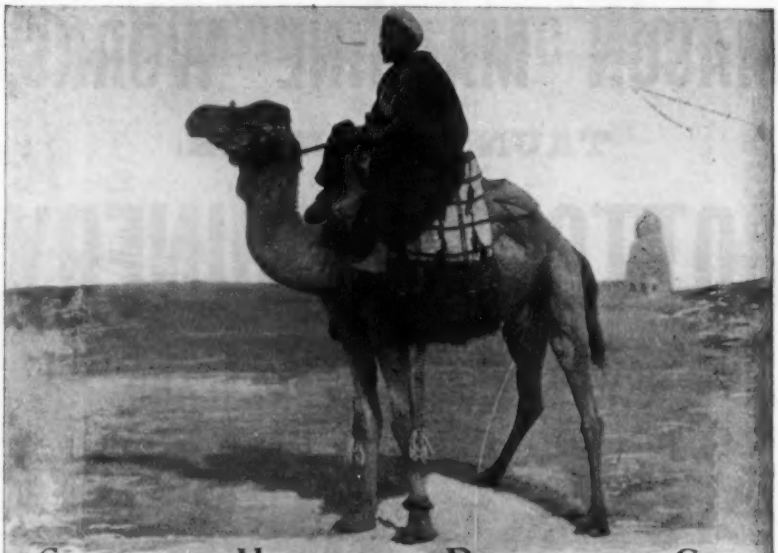

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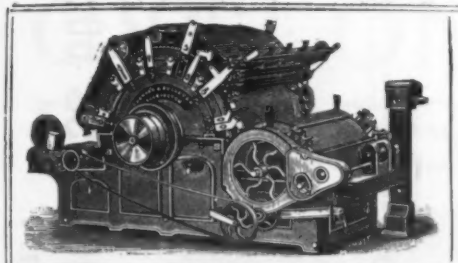

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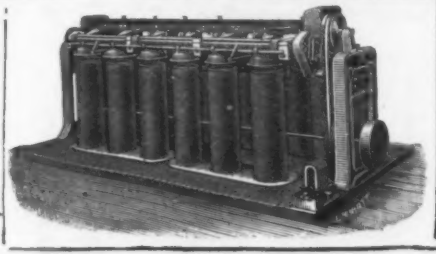

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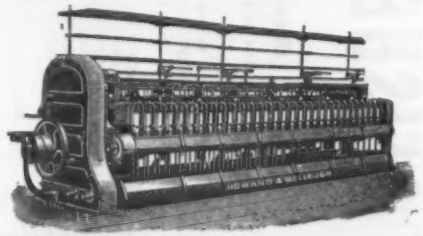

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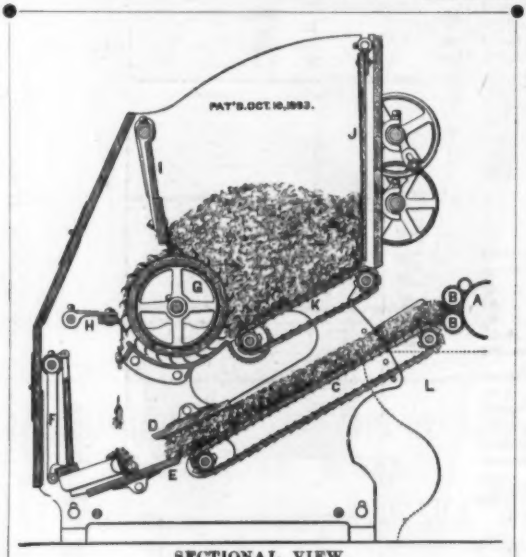

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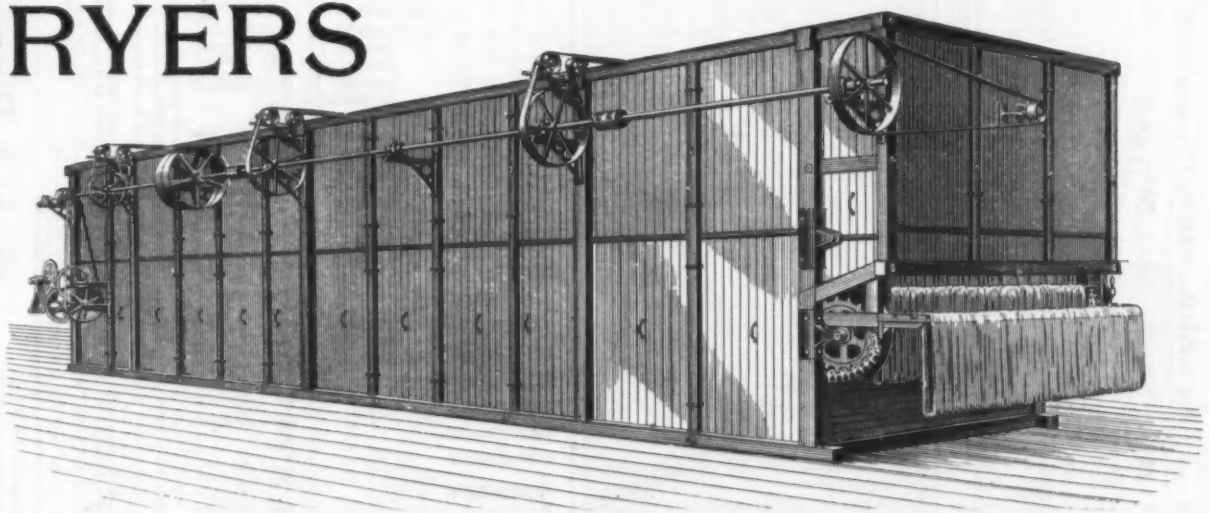

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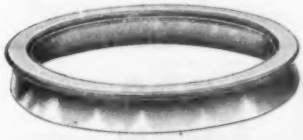

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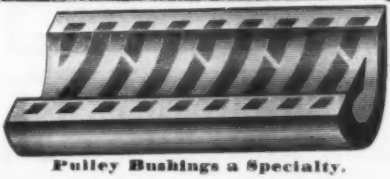

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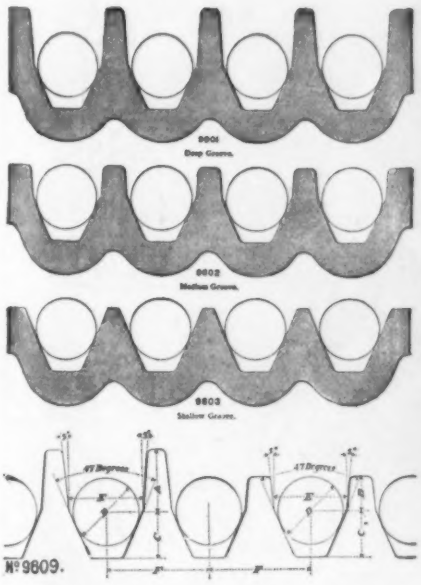

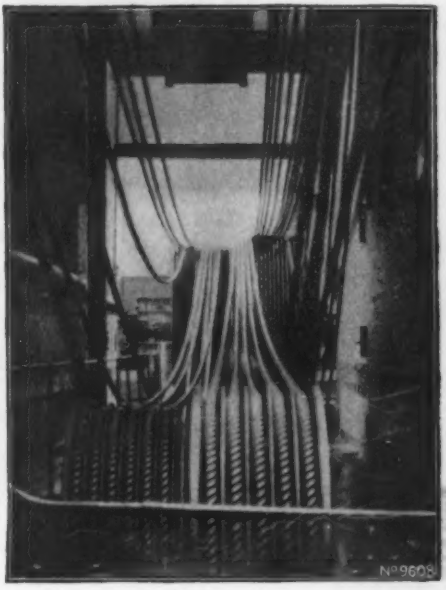

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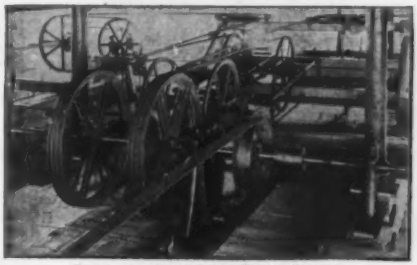

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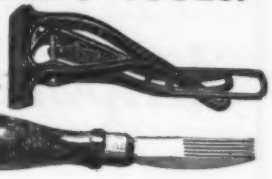

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Mr. George W. Gregory, of Crosby and Gregory, has taken out for us since January, 1875, more than two hundred patents.

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Mr. Van Everen, of our office, was for a number of years an Examiner in the U. S. Patent Office, in the Division of Textiles.

List of Textile Patents.

Issued October 25, and November 1, 8 and 15, 1898.

Cotton Press. 614,186. M. Swenson, Chicago, Ill. Assignor by mesne assignments to American Cotton Co., New York.

Cotton Picker. 613,028. C. Duvall, Ringwood, Okla. T.

Carding Engine. 614,155. J. Williams, Salford, and P. H. Allsopp, Heaton Norris, England.

Cotton Cleaner, Seed. 613,993. E. Hart, Huntsville, Texas.

Combing Machine, Wool. 613,410. J. Delattre, Dorignies, France

Drying Cylinder for Textile Machinery. 614,063. J. Butterworth, Philadelphia, Pa. Assignor to H. W. Butterworth & Sons Co., same place.

Fabric-turfing Machine. 614,084. M. Cameron, Minneapolis, Minn.

Fabric-Turfing Machine. 614,085. M. Cameron, Minneapolis, Minn.

Fur-plucking Machine. 614,408. D. D. Palmer, Worcester, Mass. Assignor to J. J. Asch, South Norwalk, Conn.

Heddle for Cross Weaving. 613,392. J. B. Patterson, Philadelphia, Pa.

Heddle for Cross Weaving. 613,615. R. Wharton, Philadelphia, Pa.

Knitting Machine. 613,808. D. F. Sullivan, Lowell, Mass.

Knit Garment, Combination. 614,290. S. Conde, Oswego, N. Y.

Knitted Fabric. 614,349. R. W. Scott, Philadelphia, Pa. Assignor of one-half to L. N. D. Williams, Ashbourne, Pa.

Holland and Colonies.

Patents. Trade Marks.

H. Massink, L. D. at Amsterdam.

Knitting Machine. 613,346. F. B. Wildman, Norristown, Pa. Assignor to McMichael & Wildman Mfg. Co., of Pennsylvania.

Loom Measuring and Registering Device. 613,959. A. & J. Bentley, Paterson, N. J.

Loom Shuttle Tension Device. 613,974. F. David, St. Etienne, France.

Loom Shuttle Changing Mechanism. 614,369. R. Crompton and H. Wyman, Worcester, Mass. Assignors to Crompton & Knowles Loom Works, same place.

Loom, Swivel. 614,390. G. F. Hutchins, Worcester, Mass. Assignor to Crompton & Knowles Loom Works, same place.

Loom Harness Operating Device. 613,451. F. Lacey, Valleyfield, Canada.

Loom Shuttle. 613,559. W. C. Collyer, Lynn, Mass. Assignor of one half to W. F. Bullock, same place.

Spinning and Doubling Apparatus, Cotton. 613,106. T. Ashworth, Urmston, England.

Spinning Machine Spindle. 613,112. T. A. Boyd, Glasgow, Scotland.

Wool, Extracting Fatty Matter from. 613,267. C. Gruene, Berlin, Germany.

Wool, Etc., Machine for Separating. 613,571. A. D. Hubert, Bierges, Belgium.

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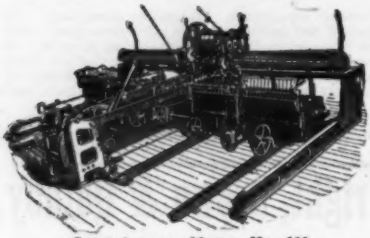

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—North Carolina, Burlington. The Secretary of State has issued papers of incorporation for the Daisy Hosiery Mills Company, of Burlington, with S. M. Holt, J. P. Faucette and W. C. Curtis, all of Burlington, as incorporators. The maximum stock is placed at $50,000, and the minimum at $2900, the latter amount having already been issued. The mills have been in operation for some time.

—North Carolina, Charlotte. George S. Hall has purchased the Charlotte Card Clothing Company's factory.

—Ohio, Tiffin. The Tiffin Woolen Mills, six sets, well equipped with machinery, and in first-class condition, is offered for sale for the purpose of closing up the estate of Samuel S. Meyers, recently deceased.

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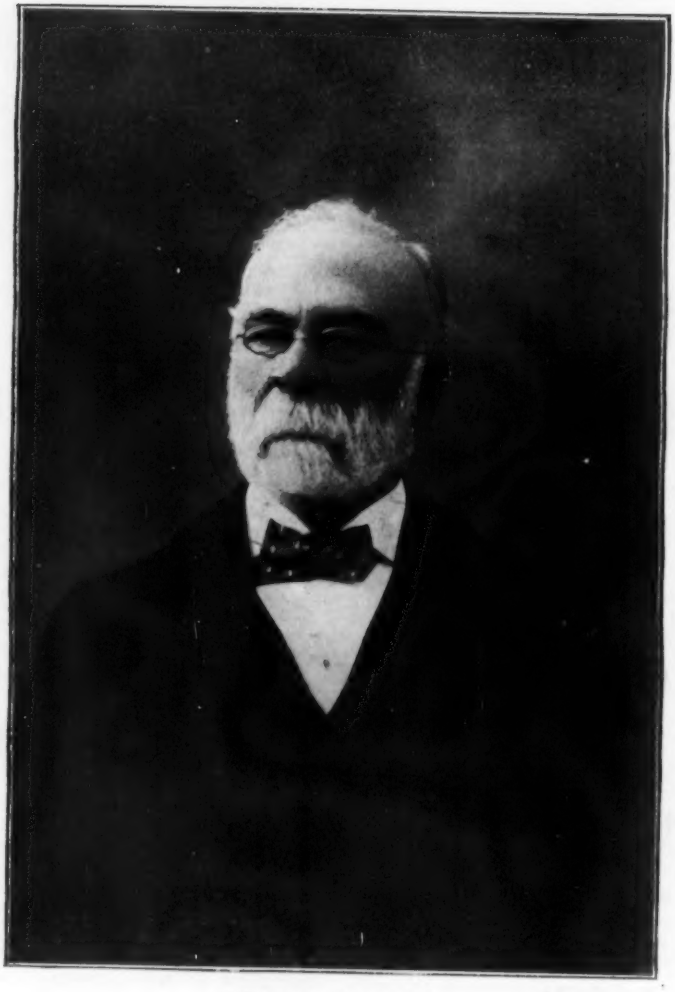

LEWIS ANDERSON.

TEXTILE WORLD.

Vol. XV. DECEMBER, 1898. No. 6.

LEWIS ANDERSON.

The subject of this sketch, Lewis Anderson of Skowhegan, Me., has long been known as one of the leading woolen manufacturers of New England. It may be interesting to his many friends to have their attention called to him at this time, and to others who have not known him, and yet who like to know or hear of the men who have had a share in advancing American manufactures, during the present and preceding generation.

It may truly be said of Mr. Anderson that his start in life was at the bottom of the ladder, and that every step upwards has been made by perseverance backed by good health and confidence, in that good results were sure to follow honest application to duty in whatever sphere a young man's lot may be cast.

Mr. Anderson was born August 8, 1836, in the village of Menstrie, Scotland, about five miles from Stirling, one of the most beautiful spots in that delightful land. He was the youngest of a large family, who were all workers from necessity, the parents being poor and obliged to send them out to work as soon as they could find anyone who would engage them. When he was a mere child, the family moved to Tillicoultry, about four miles distant from Menstrie, on account of the older boys securing work in the mills there; and about nine years later they moved to Galashiels. A few months after their removal to Galashiels, their father died, and Lewis was obliged to leave school and go to work in the mills, in that enterprising town. His first work was handing in warps and changing shuttles, for, at that time, there were few power looms, and but few of the hand looms had double boxes, so that when more than two shuttles were required, it was necessary to get a boy to stand at the end of the loom and change the shuttles, which is now done by automatic drop boxes. For this he received the munificent sum of six pence, or twelve cents per day.

After graduating as a changer, hander-in, piecer to the mules, etc., he became an apprentice with the then prosperous firm of Andrew & Richard Watson, and remained in their employ until 1854, when he bade Scotland a long farewell, and with his mother sailed from Liverpool to New York aboard the good ship John Rutledge, where they arrived after a passage of nearly six weeks. On arriving at New York it was found necessary to land the passengers and their baggage by lighters, and when the transfer was being made, a large chest containing the most valuable articles, including clothing, etc., was accidentally dropped overboard, and as the ship was surrounded by land sharks just looking for such chances, two of them secured it, and only surrendered their prey after having secured the last shilling intended for passage from New York to Saugus, Mass., where his brother Peter was located. He was therefore obliged to borrow from a good friend and fellow passenger, Wm. Fairgrieve, enough to carry himself and his mother to Saugus, where they arrived in due season, and where Mr. Anderson secured a job spinning at Scott's Mill.

He was never contented to spin, however, but wanted a chance to work

in the weave room, where he felt confident that his knowledge of designing and weaving would soon enable him to advance. Nor was he mistaken, for after having obtained such a chance, which he finally did at Sutton's Mills, North Andover, Mass., he was made boss weaver within three years. Previous to this, he had been a spinner for five or six years, and had spun in Lawrence, Mass., Northfield, Vt., Dexter, Me., etc. From North Andover, he went to Norwich, Conn., to be boss weaver at what is now known as the Clinton Mill. While there, the superintendent suddenly left, and Mr. Sturtevant requested Mr. Anderson to take charge of the mill as superintendent until they secured a new man. This he did for four weeks with the result that the month's production was the largest on the mill record. And it is pertinent here to state that within a year Mr. Sturtevant went to West Troy, N. Y., where Mr. Anderson had meantime gone to superintend the Watervliet Mills for James Roy & Co., and tried to prevail upon him to return to Norwich, offering handsome inducements.

Mr. Anderson, however, remained as superintendent of Roy's Mills at West Troy nearly nine years, and then started in business at Skowhegan with two sets of cards, and ten looms. He has succeeded there in building up quite a large business, and has become identified with other interests, such as the Lakeside Worsted Mills in East Madison, Me., of which he is President, also a large stockholder and director in the Somerset Traction Co., which runs one of the best equipped electric roads outside of the large cities, in New England. This road extends from Skowhegan to Madison, about twelve miles.

Mr. Anderson is also President of the Skowhegan Water Power Co., and interested in other enterprises of like character in the vicinity. He was the first President of the Skowhegan Board of Trade, and held that place for seven years. He has been President of the Maine Woolen Manufacturers' Club since its organization in 1886; is on the Executive Committee of the Home Market Club, and the National Association of Wool Manufacturers; is a stanch Republican and Protectionist, and, with Mr. William Dobson of Pittsfield, Me., represented the Maine woolen manufacturers before the Ways and Means Committee when the McKinley Bill was under consideration in 1889 and 1890.

Mr. Anderson attributes whatever share of success has attended his efforts very largely to the fact that in youth, and until her death in 1878, he had the good fortune to have his mother to care for. She was well qualified to inspire anyone with hope and courage, and the conviction of duty, as well as affection, withheld him from venturing into a great many of the scrapes incidental to youth, and established at least a moderate desire to be careful and prudent, as well as to try and make reasonable provision for the future. Few boys enjoyed or shared to a greater extent all the outdoor sports and games, but, having from early youth to provide for his mother and home, formed few frivolous or expensive habits.

Another matter may well find a place here, and it is to be hoped that it may not be without benefit to some young man who happens to cast his eye on this article. When about the age of 18 or 20, and looking somewhat ahead, considering how best to breast the storms of life, the thought flashed upon him that a very likely means to success would be to try and excel as a workman, do first-class work, be steady and reliable, and do all the work he possibly could without regard to wages received, the object being to convince the overseer and employer, in this way, that they could not afford to dispense with his services, and in the end would be compelled to pay good wages, because men who work on this principle are scarce and everybody wants them.

After having stuck steadily to it in the mill for over fifty years, Mr. Anderson is active, energetic, and well,

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OUR TREATY WITH SPAIN.

The status of the United States, in relation to other nations of the world, has been greatly changed within the last nine months; and greater changes are destined to take place, that will have a momentous influence upon our governmental policy, and which cannot at this time be well calculated, as to their beneficial, or other, effect upon the welfare of the people.

We entered upon the war with Spain with the humanitarian policy of liberating a people who have been misgoverned and robbed for centuries. It is, however, a serious question whether the United States care, or if it is their bounden duty, to enter upon a philanthropic policy for the liberation or civilization of down-trodden or benighted people in other parts of the world. It is looked upon by many of our wisest economists and statesmen as endangering the principles upon which our political institutions are founded, to extend our sovereignty, or control, over territory and people outside of our own realm, and into those that will bring us into conflict with the political policies pursued by European nations, into which we shall be surely drawn, or involved, for the settlement of questions entirely distinct from those that we have heretofore considered as essential to our national development.

We have looked upon the territorial extension of the United States within the influence of the Asiatic Continent, as dangerous to the welfare of this country, and we think so still. We should be glad if there were some way by which a solution of the Philippine Islands' question could be settled without carrying with it the sovereignty of the United States, to the extent of obligating our government to take an active part in any of the intrigues that may arise between European and Asiatic nations. The fact, however, remains that we have these possessions on our hands, in such a form that we shall be forced to take

cognizance of it, as demanding legislative and executive action.

President McKinley proposes to exercise a conservative policy to the extent of meeting the popular wishes of the people. It seems best, under the circumstances, not to allow any of the Spanish territory that has been taken, to return to Spanish control. This makes the situation complicated, and more difficult of solution. The question is: What is to be done? The answer cannot and should not be hastily given. An immense amount of legislation, entirely new to anything that has ever been undertaken by Congress, will have to be passed, with special reference to the government, not of colonies, but of dependencies, for it would be hardly a safe proceeding to make our Spanish acquisitions a part of the United States, in the same sense as our States and territories.

Before any settled governmental policy is arrived at, all matters pertaining to it will probably be left to the deliberation of a special commission appointed by Congress, made up of men familiar with matters that are likely to come before it. Such important questions as the following will have to be taken up and passed upon: currency and banking; taxation, tariff, etc., besides a judicial system. Reforms in these respects should be gradually introduced, so that as little disturbance as possible will be made.

We do not think it need disturb Congress in seeking a legal pretext for framing separate tariff laws for our new dependencies, notwithstanding the mandate of the constitution that "all duties, imposts and excises shall be uniform throughout the United States." It is pretty certain that independent tariffs, that will be as operative against the United States as other nations, will be instituted in Puerto Rico and the Philippines, as necessary measures for the protection of the industries now existing in this country. While these separate tariffs will be of a nature uniform against all countries, including the United States, they can readily be constructed in such a manner as to favor the products of this country, by imposing low duties upon such merchandise as we can readily export and place in competition with that of other nations. This would include agricultural machinery and implements, locomotives, railway stock, breadstuffs, etc.

There are certain constitutional questions that will have to be considered to justify the United States in receiving, holding and disposing of the territory that has been ceded to it by the provisions of the treaty. There are two provisions in the constitution that have a bearing upon this subject, under whose interpretation the action of the government can only be justified, as follows: In clause two, section three of article four, it is provided that "Congress shall have power to dispose of and make all needful rules and regulations respecting the territory or other property belonging to the United States;" and, in section eight, of article one, Congress is empowered to "provide for the common defense and general welfare of the United States; but all duties, imposts and excises shall be uniform throughout the United States."

The power to dispose of territory has been interpreted by the courts and legal authorities as authorizing Congress to make sale or lease of lands, or otherwise to raise money from them, and that the word "territory" is equivalent to the word "lands," and the phrase "respecting the territory" refers only to such owned by the United States at the time of the adoption of the constitution; and that subsequently acquired is subject to the legislation of Congress as an incident to ownership; and the right to govern is the inevitable consequence of the right to acquire.

There has never been any pretense that the purchase or cession of any foreign territory is within any of the powers expressly enumerated in the constitution. There is nothing said in this instrument giving the right to

Congress, or to any department of the national government, to purchase or accept any cession of foreign territory. A power of this kind was looked upon by the framers of the constitution with the political vision that they then possessed, as dangerous to liberty and to the maintenance of the union. This is seen in the tenor of the writings of the political economists of that time. It was regarded by the writers of that period as being susceptible of abuse, as destroying the political balance of the colonies, and sinking the old States into insignificance. This view, however, was greatly compromised by the purchase and cession of Louisiana, though an embarrassing fear remained that the new territorial acquisition would eventually overbalance the political power of the original thirteen States, in transferring the direction of legislation to the political interests of the West, detrimental to those existing in the East.

The acquisition of Louisiana was regarded at the time as extra constitutional, and was justified only upon a liberal, instead of a strict, construction of the law; a principle that has governed the legislative and judicial actions of the country ever since, in many important instances. One of the justifications of the acquirement of Louisiana was that it was "for the common defense and general welfare of the United States." This, however, was surrounded by many objectionable features, for, if Congress can appropriate money for one object, because it is deemed proper for the common defense and general welfare, it can use the same excuse for an appropriation for other objects. If, however, the United States can purchase territory, it can also govern it, and a territorial government can be created, and the acquisition of territory is incident to national sovereignty, necessarily growing out of the aggregate powers confided by the federal constitution. There is, nevertheless, no way of defending these constructions, except in the principle of a liberal interpretation such as has been given to constitutional provisions within comparatively recent years.

Such well known writers as Joseph Story and Thomas N. Cooley, on constitutional law, have said that, as an incidental power, the constitutional right of the United States to acquire territory would seem so naturally to flow from the sovereignty confided to it, as not to admit of very serious question. One of these writers says: "The constitution confers on the government of the union the power of making war and of making treaties, and it seems consequently to possess the power of acquiring territory either by conquest or treaty." All constitutional or fundamental laws of a government require liberal construction, to effect their objects, in properly meeting new conditions that are constantly arising in the history and development of the nation to which they apply.

AMERICAN THREAD COMPANY.

The prospectus of the American Thread Company, that was incorporated under the laws of New Jersey, last March, was issued on the 28th of November, with a share capital of $12,000,000, and a provision for a bonded debt of $6,000,000 more. The bonded debt is in the shape of a first mortgage bearing four per cent. gold. This furnishes a capital of $18,000,000, which is calculated to be sufficient for the purchase of the shares of common and preferred stocks, or plants, all stocks in trade, and for the payment of all the mortgages and liabilities of the vendor companies, and to supply a surplus, after providing an ample working capital, of at least $2,400,000, available as uncalled for capital in reserve. The accompanying table of distribution will give our readers the statistical status at a glance.

We give below the thirteen mills, or vendor companies, interested in this deal, together with their capitalization, which, however, does not neces-

	Common Stock.	Preferred Stock. 5% Gold.	First Mortgage Bonds. 4% Gold.
To Directors and Shareholders of the 13 Companies..... " J. & P. Coats, Ltd..... " English Sewing Cotton Co., Ltd.	$6,000,000	$2,000,000	$2,000,000
Open to Public Subscription.....		4 000,000	4,000,000
	$6,000,000	$6,000,000	$6,000,000

sarily give the true value of the shares of the companies, or their financial standing, as a number of them carry a surplus. The aggregate capital amounts to about $5,600,000.

The American Thread Company has been established primarily to unite the above mentioned American manufacturers of spool, crochet, knitting, mending, and other cotton, including, in some cases, the allied businesses of cotton spinning, doubling, twisting, dyeing, bleaching, polishing, spool making, etc. The prime motive of entering into this combination is the unsatisfactory state of business that has existed for a considerable time, due to excessive competition among the several mills and the cutting of prices, resulting in a very large portion of the trade being done below the cost of production.

The advice and co-operation of the English Sewing Cotton Company, Ltd., was sought, and two of the officials visited this country, together with accountants, to examine into the financial condition of the American concerns, and were of the opinion that the mills in question were in the highest state of efficiency, both in their machinery equipment and management. Having satisfied themselves as to prospects, notwithstanding the unsatisfactory condition of past trade, the English company agreed to take up, at par, $3,600,000 worth of the common stock. The common stock has already been subscribed to at par, by the English Sewing Cotton Company, and J. & P. Coats. The latter company has also taken $500,000 of the preferred shares, at par. It is estimated that the amount which this company will be required to pay for the purchase of the whole of the common and preferred stocks of the vendor companies, will be $11,017,630, and that the amount required to pay off the mortgages and other liabilities of such companies, will be $4,118,555, making, together, a total sum of $15,136,185.

Established.	Name and Address.	State in which Incorporated.	Capital.
1866	The Barstow Thread Co., Providence, R. I.....	Rhode Island ..	$ 100,000
1881	The Glasgo Yarn Mills, Glasgo, Conn.....	Conn.	300,000
1883	The Glasgo Thread Co., Worcester, Mass.....	Mass.	50,000
1863	The Hadley Co., Holyoke, Mass.....	Mass.	600,000
1881	The Kerr Thread Co., Fall River, Mass.....	New Jersey	1,000,000
1865	The Merrick Thread Co., Holyoke, Mass.....	Mass.	750,000
1873	The National Thread Co., Mansfield, Conn.....	Conn.	25,000
1884	The New England Thread Co., Pawtucket, R. I.....	.....	50,000
1834	The E. J. W. Morse Co., Boston, Mass.....	Maine.....	50,000
1891	The Ruddy Tnread Co., Worcester, Mass.....	Mass.	30,000
1865	The Warren Thread Co., Ashland, Mass.....	Mass.	25,000
1891	The William Clark Co., Westerly, R. I.	Rhode Island ..	600,000
1854	The Willimantic Linen Co., Willimantic, Conn	Conn.	2,000,000
			$5,580,000

—It has long been one of the greatest obstacles to American woolen manufacture, that a prejudice exists among certain classes of people against American goods. These people prefer English and other foreign made goods, not because they know anything about it, but because they have a prejudice from a past genera-

tion, that foreign goods are better. It seems that a similar prejudice prevails in our own country among the consumers of the Pacific Coast in favor of Eastern goods. There are a few woolen mills on the Pacific Slope which turn out woolen goods of good quality, and well adapted to local use. According to commercial reports, Eastern made goods are sold at a better price, even if inferior in quality. A San Francisco paper complains bitterly on this score. On the other hand, it is a well-known fact that the California and Pacific Coast blankets have a reputation in the East which enables them to realize higher prices than similar goods of Eastern make, which all goes to show that prejudice and opinions which may have been well founded at one time, but have been outgrown, exert powerful trade influences.

—Benzidine dyestuffs, which are not attacked by alkali, can be used on mercerized cotton.

NEW CONDITIONS CONFRONT US.

The political problems that Congress will be called upon to solve, or take preliminary steps thereto, during the present session, will be among the most momentous in the history of the country, as certainly they will be entirely new to our institutions, in which the constitution will have to receive new interpretations and our system of government be subject to innovations entirely foreign to the ideas of the people twelve months ago. We are entering upon new schemes of territorial and commercial expansion, and financial legislation will have to conform to the new conditions. The Treasury Department is making out its budget for the next fiscal year, as well as modifications for the remaining portion of the current year. New factors will be introduced, brought on by the late war with Spain. The estimates of the various departments are already being formulated by the Treasury Department, for the fiscal year beginning next July, and the House committee on appropriations has now before it a bill to provide for army expenses for the six months beginning with January, which were not covered by the appropriation made last summer. There is no doubt that liberal measures will be introduced and carried, to meet the requirements of the army and navy departments. Measures will undoubtedly be taken to make the receipts from customs in Cuba, Puerto Rico and the Philippines sufficient to meet the ordinary expenses of the military occupation and for the civil government of these possessions. The revenue from internal sources will be so managed as to cover internal improvements, without diversion to meet foreign expenditures.

An important factor that will enter into our commercial relations with foreign countries, as well as facilitating domestic trade, will be the position that gold will occupy as the currency to meet trade conditions. All commercial countries are now, or will soon be, upon a gold basis in all trade transactions. The gold coinage of the world in 1897 was the largest on record, amounting in value to nearly $438,000,000 against a little less than $200,000,000 in 1896. Of the former amount, $147,000,000 was recoinage, leaving about $291,000,000 net addition to the stock of gold coins. This extraordinary coinage is supposed to have been for the appropriations of Russia, Austria-Hungary and Japan, for their monetary reform. This is an important showing in the monetary conditions of the world, and the part that gold is destined to play, as a standard of value. That there will be a sufficient supply of gold to meet all of the wants of commerce, without the necessity of using silver, except for local circulation, is shown in the remarkable gold production of 1897 and the prospective production of 1898. The production for the former year has been computed by the director of the mint, at $238,000,000, and for 1898, at $275,000,000, nearly all of which is the product of the mines of

the United States, South Africa and Australia. European governments are supplied with an immense amount of gold, Russia holding $600,000,000 for the resumption of her gold payments, the Bank of France, $400,000,000, and the Bank of England, nearly $150,000,000, while the Imperial Bank of Germany has nearly $180,000,000 in specie, mostly gold, and the Austro-Hungary Bank has nearly as large a supply as the Bank of England. The monetary stock of gold in the United States is on an average of $12.30 per capita, which will not be lessened probably for a number of years to come, due to our large exports. Taking the amount of gold and silver coins and certificates, United States notes, and National Bank notes in circulation, there was a circulation per capita of population October 1, 1898, of $24.24, against $22.89 at the same time the year previous, of which a very small proportion was silver coin, though $393,000,000 consisted of silver certificates.

CLAY'S DIAGONALS.

A very interesting case has come to the attention of manufacturers of worsted goods, in the injunction of J. T. Clay & Sons, worsted manufacturers, of Rostrick, England, against a small merchant tailor by the name of Morris Goldstein, in New York, to prevent his selling worsted goods under the designation of "Clay's diagonals" which are manufactured by others than the English concern, and of an inferior quality. This came up for a hearing before the United States Circuit Court last month, to which no defense was made, and which will probably result in the granting of an order restraining the defendant from the further commercial use of the above term as descriptive of a line of fabrics.

It is the understood intention of J. T. Clay & Sons, as soon as the legal form is complied with, to institute similar injunctions against all those concerned in the manufacture or handling of such worsteds, which are exposed for sale as "Clay's worsteds." This includes not only manufacturers, but their selling agents, dealers, etc. It is stated that nearly one hundred cases are in the hands of the attorneys of the English manufacturers, showing the improper practice of using this term, for the purpose of deception. It is claimed by the English manufacturers that it is as much of a fraud to sell these goods as "Clay diagonals" as "Clay's diagonals," the difference being of no material consequence. Those in the woolen trade have asserted with truth that the word Clay has been used for a long time in a purely generic sense, without designating any particular class of worsted or imitation of worsted fabrics. If goods are sold as "Clay's diagonals," with the intention of carrying the impression to the purchaser that they are manufactured by the English concern, the matter is a fit subject for an injunction, and the latter should be applied and damages awarded. Fraud should not be recognized by the United States courts, or by any upright mercantile usage.

ALLEGED SWINDLERS EXPOSED.

The arrest in Philadelphia, early in November, of Max Franks and Charles Jarrata of 44 North 4th St., recalls the warning that was given to the trade by the Textile World in December, 1896, and illustrates the careless manner in which credits are extended by business men and manufacturers, who ought to know better than to allow themselves to be imposed upon by such methods, especially after the matter has been given publicity. The method by which these alleged swindlers operated was to write to manufacturers for samples of a certain class of goods with quotations for lowest spot cash prices. Upon receipt of the samples, an order was immediately sent, and sometimes telegraphed, for a quantity, with urgent instructions to send with all haste, terms spot cash. If the goods were sent, that was the last that was ever heard from the parties. Needless to

say there was no cash payment, and finally when the manufacturer looked the matter up, he found the office of the concern in charge of a boy, who claimed to know nothing whatever of the firm's business affairs, and stated that the proprietor was away traveling. No one but the boy was ever found. More frequently the office was locked. The concern is operated under various names, the one employed in 1896, being H. G. Matthews & Co. It seems that these operations have been going on for several years, but no criminal prosecution has ever been entered before, such manufacturers as have been defrauded, not having cared to go to any trouble in the matter, but after obtaining judgment and failing to collect on that, let the matter drop.

There is another man of this kind well known to many manufacturers, particularly yarn merchants, who hails from a city in the northern part of New York State. He has some machinery in some one else's name, but is never known to pay his bills, and seems to be execution and judgment proof. We have in the past years exposed him, but only recently learned that he had bobbed up again and was trying to work the same old game on a new crop of yarn men.

LABOR TROUBLE IN GEORGIA.

The cotton mills of the South, broadly speaking, have been happily free from labor disturbances and misunderstandings, up to the present time, and nothing, even now, has transpired of a sufficiently serious nature to call for any lengthy comments concerning the situation in the leading manufacturing States of that section. The labor trouble in Augusta, Ga., is almost an isolated case, and is the only one that has occurred in that city among the cotton mills, since 1887. The one at Atlanta, about a year ago, may be taken as an exception, of very limited proportions, to the industrial equipoise of the South. It can hardly be expected, however, that the Southern mills will remain free from labor agitation forever, but rather that they will feel the effects of organized labor, in determining wages and operating time, besides other economic questions such as have affected the mills in the New England States. These difficulties will become more and more acute as the labor market becomes more depiete of available native white help. Dissatisfaction will creep in with the advent of foreign help, and the efforts to keep down or reduce wages. Negro help is something that is not kindly taken to, and which has thus far been found totally incompetent to meet the requirements in the several departments of the mill, especially in such portions as demand skill in manipulation.

It is a somewhat singular coincidence that the excuse on the part of the mill officials at Augusta, to reduce wages, is because of competition with Southern mills located outside of that city, a plea that is familiar in the discussion of cotton mill matters pertaining to the New England industry. The fact, however, undoubtedly exists that the Augusta mills are at a material disadvantage in the cost of labor, as compared with other manufacturing places in the Carolinas and elsewhere. This is due to various causes which usually accompany the location of mills in large cities, where the cost of living is much higher than in smaller, or country towns.

According to the best information at hand, the average wages of the cotton mill help in the State of Georgia is higher than in North Carolina, South Carolina, or Alabama. This larger average is admittedly due to the higher rates of wages paid by the Augusta mills. It would seem that these Augusta wages, or those of Georgia, are from ten to twenty per cent. higher than the average in the other States named. The cut in the wages of the Augusta mills is confined, as is usually the case, to what is termed unskilled employees. The skilled workman usually has his wages re-

tained, or, if reduced at any time, it is done with more circumspection than is given to the common operative.

How much the present labor trouble will affect the increasing power of labor organizations in the South, is too early to comment upon with any degree of satisfaction. It admits, however, of but little doubt, that the labor organizations will be greatly strengthened by the occurrences that are now taking place and those that have made their advent within the last twelve months.

It is very fortunate that there is at the head of the city government of Augusta, a mayor who is so level-headed, conservative, endowed with common sense, and highly popular with all classes, as Patrick Walsh. His advice is always sincere and deliberate, taking into careful consideration the points of merit and justice entering into the case before him.

No class of mill officials within our experience, ever took upon themselves the disagreeableness of reducing the wages of their operatives, however erroneous or unnecessary it may seem to others, without hesitation and aversion. These reductions, in some instances, are ill-advised, and might be avoided by other tactics than those pursued, or by the introduction of economies in other directions. Discontented help, on account of insufficient pay, are never for a mill's good. Whether anything else could have been done by the Augusta mills, is something we cannot intelligently discuss, being uninformed regarding the details, or particulars, concerning the financial status and prospects of the mills affected. It appears that the mills are willing to meet the wages paid by those in the two Carolinas, and six per cent. more, which prima facie looks reasonable and just. The presidents of the mills show a most commendable spirit in agreeing not to discharge any of their hands on account of the present difficulty, or on account of their affiliation with any labor organization. This feeling will contribute very largely to the introduction of a more cordial entente between those in authority and those under them.

We understand that organizers operating under the authority of the National Union of Textile Workers of America are now working in Augusta to establish a union among the operatives. This organization was organized March 30, 1891, in the city of Lowell, Mass., and has held a number of conventions in such places as Fall River, New Bedford, Providence, Philadelphia, Lawrence and New York. It has organized branches from the time of its inception up to the present, in nearly all of the textile centres throughout the country. Up to last June, it had issued 135 charters, 15 of which had been issued during the preceding twelve months to textile workers in such places as Atlanta, Ga.; Germantown, Pa.; Augusta, Me.; Biddeford, Me.; North Adams, Mass.; New Bedford, Mass.; Saco, Me.; Norwich, Conn., etc. It has several local unions in Columbus, Ga., two in Alabama, and one in Tennessee. Its officials represent that it is the only national union of textile workers in the United States that is composed of all branches of the textile trade, other than the cotton mule spinners, who have a separate organization of their own. The National Union of Textile Workers of America is attached to, and a part of, the American Federation of Labor. The aims and objects of this union seem to be good, devoted to the establishment and upholding the rate of wages; which is commendable, if it can be done upon just ground, which they profess to consider in their endeavor to prevent strikes and other "attendant bitterness and pecuniary loss, by arbitration and conciliation, in settlement of all disputes concerning wages and conditions of employment." How well they carry out their object is a matter that has to be determined by their action in each case as it arises.

The Paris Exposition.

(Special Correspondence.)

At the very start the organizers of the Exposition decided that it should be held in the heart of the gay capital of France. To do this, immense difficulties were to be vanquished in order to erect the desired palaces and buildings and lay out gardens, without depriving Parisians of many of their beautiful avenues and favorite promenades. The primary object being the education of the people, it was decided to locate the Exposition where the masses could easily reach it, and the well known Champs-de-Mars, the site upon which the three great fairs of 1867, of 1878 and of 1889 were held, was selected.

The location of the Universal Exposition of 1900 will comprise the Champs-de-Mars, the Trocadero and adjoining grounds, the Esplanade of the Invalides, the Quay de la Conference, the Cours la Reine, the Palais de l'Industrie and the grounds adjoining this palace and the Cours la Reine. The Eiffel Tower and Trocadero will form leading points in the Exposition of 1900, as they did in that of 1889, but the French commissioners will present much that is new on the old ground.

The great and small palaces of Fine Arts that France is now erecting for the Exposition, at a cost of $4,200,000, will remain as permanent embellishments of the city of Paris. The great building of General Manufactures will be the largest of the Exposition, and, architecturally, the most elaborate.

Lying on either bank of the Seine are two long narrow strips of ground on which will be erected many minor buildings, and here, too, will probably be placed many of the concessions, making it correspond with the Midway Plaisance at the World's Fair in Chicago.

The Colonial exhibits of both France and foreign nations will be located in the Trocadero grounds, and here the United States will for the first time in its history, present displays from her colonies, Porto Rico, the Philippines, Hawaii and Cuba. One of the greatest displays of the Exposition will be that of the electrical industries. The electrical building will be across the river Seine from the Trocadero Park near to the structure devoted to Agriculture and Food Products. Some ten or more electrical companies in the United States have already asked for over 75,000 square feet for exhibits.

Between the various tracts which form sites for the palaces and buildings, handsome, well-shaded avenues will run in every direction, so that easy and pleasant progress may be given from one portion of the grounds to another.

M. Alfred Picard, Commissioner-General, has devised a new system for the classification of exhibits. In all sections of the Exposition, the working plant and the process will be in close union with the products. Machinery will be in motion before the eyes of the public, so that visitors will be initiated into the different modes of manufacture. The public will thus be able to witness the successive transformations of raw material until the object is manufactured completely. To the various contemporaneous exhibits, centennial retrospective exhibitions will be added. These latter exhibitions, instead of being concentrated, will be disseminated among the various groups and classes, so that they cannot escape the attention of the general public. In a word, every group will be preceded by a sort of little museum, which will show the most notable progress accomplished since the year 1800, or in a period of 100 years, in every particular.

In the classification of exhibits in Paris in 1900, the harmonious arrangement of objects will be like a mirror in which the mind of all the nations of the world will be reflected. Fine arts will not be neglected at the 1900 Exposition. In the splendid palaces to be erected in the Champs-Elysees,

painters and sculptors will find a home worthy of their great productions.

There will also be a retrospective exposition of art during the nineteenth century. The word art at the 1900 Exposition will be given a very broad interpretation. To the paintings and sculpture of every epoch of the present century will be joined some of the finest bronzes and many of the most remarkable specimens of porcelain, of gold and silver, also of furniture.

The demands for space for concessions of all sorts and descriptions are great. Many of the proposed amusements and shows are novel, curious and unique in the extreme. These requests for concessions are reaching the French commissioners from all parts of the world. A well known American brewing company has asked permission to erect a tremendous barrel of beer, 52 feet in length and 29 feet high. Inside this two-story glass house, for the barrel is to be made of glass, will be erected an American bar-restaurant.

The moon, at the distance of one yard from the earth is promised as one of the great attractions of the Exposition. A wonderful telescope weighing 500 pounds, and costing $150,000 will perform this remarkable feat. A "Bottom of the Sea Aquarium" will show the wonders of the deep, thousands of feet below the level of the sea. There will be a "temple of gold," sliding railways, captive balloons, a history of costumes, restitution of old Paris, flying apparatus, palace of crystal and ceramics, panorama of French history and hundreds of other novelties.

All the sovereigns of Europe, Asia and the whole world will attend the Universal Exposition of 1900. The Shah of Persia has notified the French government that he will make a long voyage to Europe in that year, his first resting place to be St. Petersburg and from there to Paris. Negus, the African emperor of Abyssinia, will spend three months at the Exposition. Queen Victoria, who visited the Paris Exposition in 1855, will attend in 1900, if alive and well. The sovereigns of Russia, Prussia, Turkey, Greece, Egypt, Japan, Portugal, and other countries, attended by princes of royal blood and large retinues of soldiers and servants will visit Paris and the Universal Exposition. The glorious old city of Versailles, whither American tourists to Paris always wend their way, will be full of interest in 1900. A series of fetes will be given in the park of Versailles, and Venetian fetes, military tournaments, choral singing and horn tournaments are on the programme for Versailles celebrations.

And so the new century will be inaugurated in 1900 at Paris, by a solemn review of all inventions and improvements with which the years of the past century have inspired the genius of man.

The Universal Exposition of 1900 will be in reality the centennial international fete, for reflective and working humanity, a serious institution, a medium of study and not a mere curiosity show. It will stand forth as the greatest international gathering of the century, showing the growth and progress of the higher instincts of humankind in 100 years.

Leading Light Weights.

The prices of the leading lines of fabrics sold are always of interest to the manufacturer, and while the following list does not contain all the leading lines, it has the bulk of them. It is always difficult to secure the prices, so that they are absolutely accurate in every instance, but every effort is made to have them nearly so.

The largest quantity of goods was sold in worsted fabrics, and this will account for the large number of this class.

The general run of colors was somewhat lighter than for a few seasons past. The finest line of worsteds shown was the line made by the Hockanum Co., one grade being $3.00 less

10 per cent., another $2.87½ less 10 per cent., and containing some small check patterns with twist, which show the general character of patterns for medium priced heavy weight worsteds. The same is also true of the $2.75 less 10 per cent. line. In the $2.87½ grade, there was a herringbone stripe pattern, the stripe of different widths, which shows one of the best patterns of this character on the market, and as this is what the trade are demanding, it would be well to obtain samples of the same.

The silk mix fabric, black grounds with different colored silks, was $2.50 less 10 per cent. An unfinished worsted line, blacks $2.12½, blues $2.25. A fine serge, black $1.50, blue $1.62½, also unfinished and finished twills, at the same prices as serge line.

The Hockanum wool goods are made with twist yarns, $1.50-$1.55, and these are the class of fabrics which will be sold during the coming heavy season.

The "Yeovil" worsteds, made by Phillips, contained some very handsome patterns both in stripes and suitings; they are a backed fabric, and have the firmness required in a high priced light weight, the prices being $2.10 less 5 per cent. and $1.95 less 5 per cent.

The "Oswego" worsteds, made by Chas. Fletcher and sold by F. Vietor & Achelis, through R. Babcock's department, were $1.75 and $1.50, both lines being through and through fabrics. This same house had a line of backed worsteds at $1.75, and a cheaper grade, all cotton filling, at $1.30.

The "Manchester" cassimeres also sold through them brought $1.25. Strong, Hewat & Co. had a line of wool cassimeres at $1.25, some of the suitings containing twist.

The "Globe" worsteds were $2.62½, $2.50, $2.37½, $2.25. The fine covert cloths, made by the "Broad Brook" and sold by Ogden & Brook, were $2.00 for both the whip-cord and covert weave, and also a herringbone whip-cord. The worsted lines of this same concern were $1.80 and $1.60, and contained some good patterns for stripes. The "Perseverance" worsteds were $1.57½, in a line of black and whites. The "Centrals," made by Farwell, were $1.57½ for the fabric which was woven through and through, and had the suiting patterns, and $1.65 for the backed fabric having the trouserings.

The "Gloria" worsteds are all worsted through and through fabric, sold at $1.30. The patterns were principally neat checks. The "Fultons," a line similar to the preceding, was also $1.30, the pattern effects being larger. The "Viking" cassimeres having a Saxony finish were $1.30. Hardt Von Bernuth & Co. got out an imitation covert at $1.00, which, for a fabric of this class, is the firmest on the market. They also had worsted lines at $2.85 less 5 per cent., $2.70 less 5 per cent., $2.10, $1.62½ and $1.50.

W. E. Thlotson's "Silver Lake" worsteds, which have the reputation of having the best line of stripes in the market, were $2.25 less 5 per cent. and $2.15 less 5 per cent. The Oregon City Manufacturing Co., which obtains the worsted end of the business from Chas. Fletcher, had lines at $1.20 and $1.67½. The wool goods were $1.25, $1.50, $1.62½ and $1.75, many of the styles above $1.50 containing twist. Brigham, Laurie, Mason & Co. had worsted lines at $1.87½ and $2.50. Stevens, Sanford & Handy's worsteds were $1.20, $1.57½ and $1.65.

"Sawyer's" worsteds were $1.87½, $2.00 and $2.25; the last named grade having some check patterns made with all twist which are very desirable patterns. Oelbermann, Dommerich & Co. also had a line of worsteds at $1.80 less 5 per cent., some of the patterns being large plaids, but subdued in pattern on account of the combination of color used. Cooley, Turnbull & Co. had a line of worsteds, containing cotton both in warp and filling, which sold at $1.00 less 5 per cent. Dudley, Battelle & Hurd sold a sightly line of worsted stripes at

$1.12½, this fabric being backed with a twist. They also had a line at $1.37½.

Converse, Stanton & Co's worsteds were $1.75 less 5 per cent., and $1.85-$1.95. A line of whip-cords sold by the same firm were $2.25 less 5 per cent.

Forstmann & Co., Emerson's Department, had a line of worsteds at $1.60. Rockfellow & Shephard's worsteds were $1.30 and $1.67½, and in pattern were good copies of the Hockanum patterns of previous season. John & James Dobson had worsted lines at $1.62½, and silk mix worsted at $1.85, and a fine venetian at $2.00. Ould & Bigelow had a worsted line at $1.17½. Sullivan, Vail & Co. sold wool goods at 77½, 85 and 87½ cents, and a fine twill in mills at $1.20, and cassimere line at $1.37½. Curtiss & Warren, the western manufacturers, had a line of wool goods at 85 cents. W. Stursberg, Schell & Co. had a worsted line at $2.12½ less 5 per cent., and a fine worsted covert at $1.75. Henry W. T. Mali & Co. had line of wool stripes at $1.25, and Duval, Cone & Glover a line of worsteds with plenty of cotton at 95 less 5 per cent. The "Langham" worsteds were $1.25. Kunhardt & Allen had their usual line of wool goods, the prices being $1.37½, $1.42½, $1.50 and $1.62½. The line at the highest price contains some of the finest styles, both as regards pattern and color. They also had the usual knickerbocker twists at $1.00.

Cotton Mills in China.

In 1896, the Blackburn Chamber of Commerce, England, dispatched a special commission to the interior of China, with the primary purpose of inquiring into the present condition of trade in that country; to study and make notes on local customs and usages, as they might affect the English textile industry; to inquire closely into local wants and requirements; to obtain, if possible, exact information regarding the trade of the great markets and distributing centres of the Chinese Empire. The members of the commission left England and started upon their journey through China from Shanghai, proceeding by the Yangtsze River, traversing the interior of the country, extending in time, over eight months, covering 4300 miles, and reaching Hong Kong, in July, 1897. The report of this commission has recently been made to the Blackburn Chamber of Commerce, a copy of which has been especially sent to us. The report gives a complete list of the cotton mills now at work in China, thirteen in number, ranging in size from 11,000 to 65,000 spindles per mill, aggregating 417,000 spindles, and 2100 looms.

The end of the disastrous Japanese campaign, and the subsequent signing of the Treaty of Shimonoseki, marked the beginning of an era of commercial and industrial enterprise and activity that has already produced results satisfactory to the initiators, and that cannot fail to be a source of great wealth to the country in the future. Amongst the concessions wrung from China—and it may safely be said that but for the exigencies of war they never would have been granted—the one most important to foreigners was that conceding to them the right to import machinery, and to engage in all kinds of manufacturing industries in the open ports of the country. Foreign firms, who were large importers of English piece goods and Indian yarn, and who saw the ever increasing and almost illimitable demand for yarn of coarse counts, at once took advantage of the new treaty, and began the erection of four spinning mills. Three of these were to contain 40,000 spindles each, and the other 25,000 spindles. Previous to this time there had been in operation in China six mills, containing 183,000 spindles, owned and worked for the most part by officials, who had, to their chagrin, found foreign supervision indispensable. These officials look upon the mills in which they are interested as very proper places of employment for their needy friends and relations; and in

Chinese owned mills one is surprised to see in every department numbers of richly dressed, indolent gentlemen, lolling about, or deeply engrossed in the study of Chinese classics. Inquiry from the English manager elicits the information that these are the friends of the controlling officials, and that, they are mostly content to leave everything to the foreign manager, and, in fact, may for months together never be seen at the mills, except when their salaries are due.

The erection of several new mills is being contemplated, and for one at least, a mill of 100,000 spindles, the order for machinery has already been placed with a Lancashire firm. The four newly-erected, foreign-owned mills only commenced operations in the early part of 1897, and have not yet all their spindles working.

TYPICAL MILL HANDS IN CHINESE FACTORIES

although they knew absolutely nothing of the work, in fact, being literati, they have a profound contempt for manual labor of any kind; they are all on the pay list, as "superintendents, overseers, and as upper hands," with similar euphonious titles. These men are simply to be regarded as parasites fattening on the labor of others, for, although they nominally occupy responsible posts,

The cotton used is all of local growth and origin, and one sees the cotton plants, an annual shrub, growing abundamly right up to the very gates of the factories. The greatest

quantities are grown in the Eastern provinces, abutting on the Yangtsze, and in the Hankow district, though the plant is to be found along the course of that river as far west as Kuei-chow Fu, in gradually decreasing quantities. The staple is short, harsh in "feel," but of good color, and very clean and free from chips. The best quality is that grown at Tungchow, a place forty miles distant from Shanghai.

There is a considerable quantity of brown cotton grown within a few miles of Shanghai, which is now being used in some of the mills. It has all the qualities of the white, but is, in addition, more wooly, and has better flocking qualities. It would not be found profitable to attempt the spinning of higher counts than 20's from the cotton as it is at present brought into the market. All grades are lumped together when being brought to market. It is very improbable that the farmer will see the advantage of attempting to produce a better stapled cotton by careful selection of seed, and improved methods of cultivation. The Chinese, in their ultraconservatism, are very slow to move, and seldom attempt to improve the breed of animals or growth of plants, as is shown by their failure to produce teas suitable for the altered taste of the people in Europe. From time to time other cottons have been experimentally tried, with a view to ascertaining whether a suitable cotton could be imported cheaply enough to compete with the Chinese crop. Thus one Shanghai mill has tried 100 to 150 bales of American in this way, and although a much greater production and a better yarn were obtained, the cost of the raw material was too great, and a correspondingly higher price could not be realized for the yarn.

At one of the new mills, where Chinese cotton is being solely used for spinning 14's and 16's, the percentage of loss per 100 pounds, was as follows: in exhaust opener, 3lb., 8 oz.; in finisher, 1 lb., 3 oz.; in card strips, 2 lbs., 3 oz.; in card fly, 1 lb., 9 oz.; in invisible loss, 2 lbs., 9 oz.; or 11 per cent.

One would expect, considering the natural clearness of the cotton, the percentage would have been lower, but it must be remembered that in every department of a mill worked by Orientals, there is an amount of waste continually going on that in an English or Lancashire mill would speedily end in bankruptcy. We are unable to explain why Chinese cotton should be so dear as compared with similar qualities grown in other countries, especially when the low prices of other native productions are considered. The counts spun range from 10's to 16's, there being the greatest demand for 14's to 16's. There is no difficulty in selling the yarns, and large quantities are purchased by people coming to the mills for a few bundles at a time. These mills which have looms, spin some weft for their own use, but no weft is put on the market from any of the mills. Much of the yarn is sold at the mills for distribution among the handloom weavers of the district. This is made up by the purchasers in quantities suitable for being easily carried into the surrounding country.

The managers of foreign owned mills are expecting, when all the machinery is in operation, and when the natives understand their work, that they will produce 8 oz. per spindle per day of 11 hours, of counts 14's and 16's. It must be remembered that the majority of workpeople when first taken on know absolutely nothing of the work, and have to be taught everything—difficulties that put, for the time being, the question of production in the background.

The cloths produced at the mills have no wide range of quality or character, consisting, as they do, of plain cloth, sheetings and drills. All the mills work night and day, thus necessitating two shifts of workpeople, and on taking an average of the various mills, we find that each set work 71½ to 72 hours per week, and

will put in 200 to 320 working days per annum. During the day there is a break of one hour for the mid-day meal, but during the night there is no stoppage, the workpeople sustaining themselves by a small quantity of food, hastily taken as the opportunity serves. At the time of the Chinese New Year the mills stop for one week, and considerable trouble is experienced from the laxity of the people in not returning to their work at the appointed time. It is difficult to get them to realize that at the end of one week they must return promptly, and they seem to think that a day or so is too small a matter to make any trouble about. With the exception of reelers, all persons are paid by time, and an able-bodied, experienced hand will only earn 15 to 20 cents per diem.

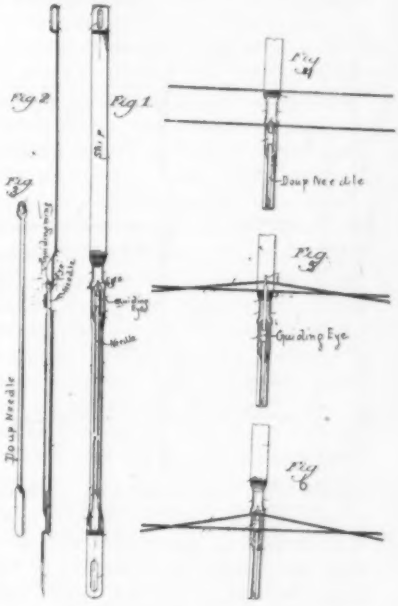
The equipment of these mills is as complete in every respect as the most modern of our English factories, and no expense has been spared in buying machinery and appliances of the latest and most approved designs. Each building—they are, on account of the difficulty of obtaining good foundations constructed two stories high only—is lighted throughout with the electric light, and has a complete sprinkler installation, whilst the machinery, engines, and boilers are of the best Lancashire make.

Heddles for Cross Weaving.

We illustrate, herewith, two methods designed for cross weaving, effected by the construction of the heddles. We do not think that the illustrations will require any particular description, as they will be clearly understood by any weaver, upon examination. We have endeavored to make them self-explanatory.

Referring to the device represented in figures 1 to 6, the doup heddles control the doup threads, or warps, and so operate as to cross the latter one over the other, in the formation of the sheds in weaving. Figure 1 is a front elevation of a heddle strip showing the device. Figure 2 is a longitudinal, vertical, sectional view of Fig. 1. Fig. 3 is a perspective view of a detached doup needle. Figures 4, 5 and 6 are diagrams illustrating the operation of the heddle strips in crossing the warp.

These doup-heddles consist of a series of strips or members combined with doup-needles which control the doup threads or warps and operate to lift them first on one side of the free warp and then on the other without the necessity of shifting the heddles laterally. In devices of this kind difficulty has been experienced heretofore in effecting the crossing of the threads with certainty and precision,



and this has been particularly the case in fine weaving, where the threads must be brought very close together.

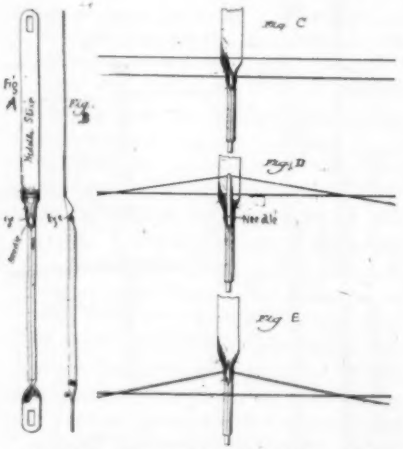
The objects of this heddle are to enable the crossing of the threads to be effected with facility and precision, to prevent the doup-needles from catching on or passing on the wrong side of threads, to enable the doup-heddles to perform fine work, to enable the heddle members to be easily and quickly put together and the doup-needles to be applied and remov-

ed, to enable the doup-needles to move freely and without liability of binding or twisting, to maintain the heddle strips and needles which compose the heddle in proper position, and to simplify the construction.

Figures A to E show another method for accomplishing the same object as the preceding.

Figure A is a front view of a doup heddle strip, and Figure B is a side view of the same. Figures C, D and E are diagrams illustrating the operation of the doup heddle strips and crossing of the warps.

In carrying out the purpose of this latter device, there is also employed a



heddle strip combined with a doup-needle which controls one or more doup-threads so constructed and operated that during the formation of the sheds the doup-needle warps and free warps are crossed. These devices are so operated that the doup-needle thread is first lifted on one side of the free-warp thread and then upon the other side; and to effect this result without shifting the heddles laterally there is constructed a heddle strip with a thread guide, that, while it will permit the doup-needle thread and the doup-needle to pass outside of the free-warp thread when it is lifted independently of the heddle-strip, it will force that thread over the doup-needle and doup-needle warp when the heddle member is lifted.

Technical Education in France.

We have been favored with an advance report from the author, Chas. C. Perry, on French Technical Education, ordered by the Parliamentary House of Commons, England. Mr. Perry takes up his subject on the line of the recent legislation on French primary technical education, and its practical working, or application, being the result of an extended visit among the schools and the investigations of their systems.

To summarize his report, it appears that French views on technical education may be said to demand attention chiefly in so far as they bear on the organization of primary technical schools. If in secondary and higher technical instruction we admit the authority of German methods, we may well look to France for some light on the subject to which the State, in conjunction with the best authorities of the country, has devoted close attention for more than twenty years. It cannot, at any rate, be doubted that in French experience we may find ample illustration, if not in every case an adequate solution, of questions which in other countries are still subject to discussion and tentative experiment.

With a view to securing greater clearness in a matter of some intricacy it may be well to review shortly the general development of the French system, with its main results, and then to examine one or two of the more important characteristics in which that system presents a contrast to English methods, for example. The movement in favor of primary technical education was originally due to a perception of the fact that a marked decline had taken place in the technical skill of the country. For this deterioration two main causes were assigned. It was recognized, on the one hand, that the old system of apprenticeship, i. e., a system under which an apprentice received a definite and prolonged training at the hands of a master in the trade, had practically ceased to exist, and that

modern industry was tending more and more to regard each individual worker as a tool which should possess just sufficient intelligence, and no more, to do the restricted task required of it. It was, on the other hand, no less evident that the complexity of modern trade processes had increased to such an extent as would render the old system of apprenticeship, were it still in operation, quite inadequate for the necessary work of instruction. For this condition of things the State undertook to find a remedy, wisely recognizing that it was hopeless to expect from trade itself a regeneration of trade methods, and that for this purpose an impulse was required which could only proceed from a central authority.

By the law of December, 1880, primary technical instruction was for the first time placed on a definite basis. As a nucleus of the new organization, the apprenticeship school, such as already existed under municipal management in different parts of the country, was adopted, and was now incorporated into the public system of primary instruction under the name of Ecole Manuelle d'Apprentissage. To this type of school, a number of other schools, styled, in virtue of the modicum of technical instruction which they provided, were to be assimilated. It is the progress of this assimilation, to use the expression in a more literal sense, which may be said to constitute the history of the primary technical instruction in France during the last eighteen years. The gradual approximation of a less practical to a more practical type of school is but the logical outcome of a policy, which, recognizing that old methods of trade instruction are extinct, has deliberately resolved to create, in their place, a new and living bond between the apprentice and the trade workshop, a bond, which, slender at first, has been continually growing in strength.

It was not till the establishment, in 1886 and 1887, of the schools at Voiron and Armentieres, that a definite step was taken by the two ministries towards the realization of their declared policy of approximating educational methods to the requirements of trade.

Though with the foundation of the national schools and the issue of a syllabus, the limit of the concerted action of the two departments has been reached and the next step is taken by the Ministry of Commerce on its own responsibility, the legislation of 1892 is no more than the natural development of a movement of which the principal aim had been from the very first the approximation of the school to the workshop.

In a special degree, however, the institution of the practical schools was intended to remedy the existing scarcity of workmen in the mechanical trades which was recognized as constituting a serious danger to the general prosperity. The new type of school is intended to turn out apprentices possessing a sufficient stock of technical knowledge. To assure this, and to prevent the apprentices, on entering the trade shop from being greatly inferior to the actual workmen, the official syllabus declares it to be essential that workshop practice should play a large part of the curriculum of the school. A further indication of the essentially practical character of the new schools appears in the recommendations which the official programme makes with regard to metal and wood work. The scheme of instruction in the latter subject is not to contain anything calculated "to make a mere amusement" of the work. Certain exercises which are prescribed in some methods and which consist in "the execution of small models and little articles on a reduced scale, with a view to giving the hand a certain dexterity, although the pupil is as yet ignorant of the proper way to handle the tool which he is using," are condemned as quite unsuited to form the basis of serious apprenticeship. The view here expressed is noteworthy, not only as establishing an essential distinction be-

tween some of the generally accepted methods of manual instruction, as opposed to those of the trade shop, but as contesting the utility of the one as a preparation for the other.

It should be noticed that though it is in the practical schools that we see the system of apprenticeship carried out in its fullest extent, the principle underlying the system is not confined to these schools, but is practically inherent in every form of technical instruction in France which is in any way preparatory to trade apprenticeship. The distinction between preparation at a school for trade apprenticeship and actual school apprenticeship preparatory to trade apprenticeship, is in reality one of degree, not of principle. No sharp line of division can be drawn between the two systems.

With the doctrine of "immediate utilization" the approximation of the school to the workshop may be said to have reached its completion, and French primary technical education its climax. It would, however, be a mistake to suppose that this principle carries with it that of actual supersession of trade apprenticeship itself. Such an intention the official syllabus expressly disavows. "It is not expected that an apprentice, on entering a trade shop, should at once reap the advantages of the technical training which he has received at school, or that he should receive the same wages as a workman already inured to the toil of a regular day's work. It must be remembered that the practical value of an artisan consists not only in the knowledge of his craft, but in the amount of work which he produces.

At a school an apprentice acquires a theoretical and practical knowledge of his trade, but only a trade shop can teach him to produce. He enters the trade shop as a partially experienced workman to finish the second stage of his apprenticeship. Though many trade processes will be new to him the principle underlying them all will be familiar, and as his experience grows, he will, in virtue of his technical knowledge, surely outstrip those fellow apprentices who have not had the advantage of a school training." The essential distinction existing between school apprenticeship, of however strict a type, and trade apprenticeship, between the educational methods of the one and the economical working of the other, has always been recognized in France. The French system is based on the generally recognized fact that trade apprenticeship, in the older sense of the term, is extinct.

As a further trait, natural to a system of supplemental instruction, may be noted a defective sense of proportion, a tendency to regard the industrial world in the light of an oriental bazaar, in which every trade and craft is represented with such a conception that ironmongery and dressmaking, plumbing and bee-keeping, carpentry and cooking are mentioned in the same breath, and that instruction in one or all of these subjects are provided with equal impartiality. A scholastic system, on the other hand, regards certain forms of industrial activity as standing, in virtue of the wideness of their scope, and the diversity of their application, in a position of unquestioned pre-eminence. These it cultivates and fosters by organized methods, viewing them as the main arteries through which the industrial life of the country flows.

Bleaching Knit Goods.

Editor Textile World:

Of late much has been written and printed on this subject, the latest being an article in the Knitter's Circular, of England. The formula there given reads as follows:

"Great stress is laid on a thorough preliminary cleaning, for which, if necessary, even caustic potash may be used with discretion. At all events, none but potash soap should be employed. The bleach bath is made up for 100 lbs. of goods, by mixing one

half pound sulphuric acid, 66 degrees Be. into the necessary water, dissolving separately, 2¾ lbs. oxalic acid, and add to the bath, then stir in 2 lbs. peroxide of sodium, and lastly, make alkaline with 2 lbs. of silicate of soda. Enter goods, warm to 110 degrees F., bleach 2 to 6 hours, wash thoroughly, give 5 minutes in a sour bath, of 110 gallons water and 8 lbs. oxalic acid, wash again and dry. The silicate of soda may be replaced with 5 lbs. marseilles soap. The bleach bath is restored for the next batch by the addition of one-half the above chemicals with the exception of the silicate and soap. Nothing has yet been found to equal the peroxide for bleaching qualities and peroxide of sodium is recommended only because it is the cheapest and most convenient variety."

As one familiar with the use of peroxide, let me say, that if this is really practical, it should be a very great stride in advance. The cost I will place as follows:

½ lb. Sulphuric Acid, ½c.; 2¾ lb. Oxalic, 19¼ cts.: 2 lbs. Peroxide, 90 cts.; 2 lbs. Silicate Soda, 4 cts.

Add about 55 cents worth of the chemicals for the second hundred pounds of goods, and 8 lbs. oxalic—about 56 cents worth—for the sour bath, serving both lots, and we have $1.12 for the bleaching chemicals for 100 lbs. of goods, which, I think, is a very low cost indeed, when we consider the little handling called for by the process.

The cost of the peroxide bleaching is thus brought down to very nearly the cost of the old lime or sulphur treatment. The new method has, heretofore, offered little inducements to manufacturers of medium priced or cheap hosiery and other knit goods, but now it seems to be within the reach of even the cheapest caterer to the bargain counter of department stores.

But what does the advent of the peroxide bleached goods signify?

This: The manufacturer will be sure that his goods will come out of the bleach as strong as they went in, and that they will not contain any chemical which will shorten their life. He can "bank" on his goods keeping their bleach unimpaired by time, and also that the dye he may have put on will remain as bright as ever. He can dye in any color he pleases, as there is nothing left in the fibre, after bleaching, which will influence any dye. This latter quality will open a whole vista of new shades that were not practicable before. He can moreover turn out white goods which are white, and which will remain white, instead of becoming yellow and gray and growing more dingy with age. This latter point will appeal most forcibly to the retailer, who will know that he need not sacrifice his goods that are left over, for fear that they will fall apart if he keeps them.

The consumer, of course, is the largest gainer, but through him also every intermediary branch back to and including the mill. He will enjoy, as something long lost and almost forgotten, white and clean looking underclothing, which will no longer, by its acid nature, irritate his skin. Perhaps he will not find these articles on the bargain counters, as heretofore, but we think he will be glad to pay more for the satisfaction, comfort and wear he gets for his money.

It is hoped a great many of our mills will look into this matter intelligently, and in making trials will not be discouraged by a failure at first, since no doubt, our English cousins, notwithstanding their many professions of friendship of late, are wily enough not to tell all they know. If they, for instance, can discourage the use in this country of peroxide of sodium by reason of failures of trials made according to their recipes, but without having informed us of some small, but essential point, they will be just so much ahead of us. We happen to know that they themselves employ large quantities of the chemical.

BLEACHER.

Negroes in Southern Factories.

Editor Textile World:

The question of employing negro operatives in the cotton mills of the South has been largely discussed for the last three or four years, and in the Carolinas the experiment has been actually tried in four mills, one, at Charleston, dismissing all its white labor and taking on negroes exclusively—as was necessary, however, if negroes were to be employed at all.

Two of these mills failed after a year's unsuccessful trial of the experiment (the Elmwood at Columbia being an especially disastrous one), and another dismissed the negroes as a failure at the end of one season, while the one remaining (at Charleston, but owned by Boston people), is again taking on white help in the "upper stories" of the mill, with the view of gradually turning the negro adrift entirely, thus again demonstrating his failure as a cotton mill operative.

In spite of all this, the question is not, in the minds of a few, definitely settled, and one or two North Carolina mill proprietors think that they can succeed with the cheap and clumsy and shiftless labor where others had failed.

But the "negro question," anent his being employed in cotton mills in particular, has been settled by the political campaign just closed, that no negro will ever be taken into a Southern cotton or other textile plant again, except to do such menial work as white men will not perform.

The "negroizing" of the counties and cities of the eastern section of North Carolina with the rottenness, thievery, incompetence, high taxation and debauchery, and a long train of evils which have followed in the wake of negro rule in public offices, have taught the manufacturers and business men such a lesson as they will never forget.

No additional negroes will be imported to work in cotton or other mills, and the thousands of stevedores at Wilmington, Newbern and other cities, are to be discharged and white labor substituted from the North, the same as in many other trades, as carpentering, brick and stone masons, and blacksmiths especially.

White employers have formed local organizations pledged to this policy, which was inaugurated last week. By this means it is hoped to decrease the large negro population by compelling much of it to go elsewhere.

CAROLINA.

November, 1898.

Spinning on the Bare Spindle.

We showed in our last May number, a scheme for spinning cotton yarn on the bare spindle, which attracted some attention. This method has taxed the inventive ingenuity of mill men for a considerable number of years, but no commercial success has been the result, so far as we can learn. Experimental efforts have been made that seemed to indicate success, but failure always followed when put to a practical test in a mill.

Another invention has been placed before English spinners, which we herewith illustrate, but how successful it has proven we are unable to state. We show it to our readers at the present time more as a curiosity than anything else, without attempting to express an opinion as to its practicability.

The most serious difficulty in spinning upon the bare spindle is the tendency for the yarn to break when winding it on the nose of the cop. This is due to the small diameter of the spindle. The yarn, in winding on to the nose pulls the traveler against the ring, instead of tending to carry it around the ring, thus the strain on the yarn is often great enough to cause breakage. To overcome this defect, many devices have been tried, one of which is to arrange the guiding of the yarn so as to get it away from the nose as quickly as possible. One way of accomplishing this has been to raise the spindle at the same time as the ring rail has been lowered, thus getting a very quiet traverse of the yarn away from the nose of the cop.

Our illustrations show a recent improvement made by Messrs. Martinot and Galland, the object of which is to facilitate the rapid movement of the yarn away from the nose. Fig. 1 shows the mechanism when the ring rail has nearly arrived at the top of its lift, whilst Fig. 2 shows the same

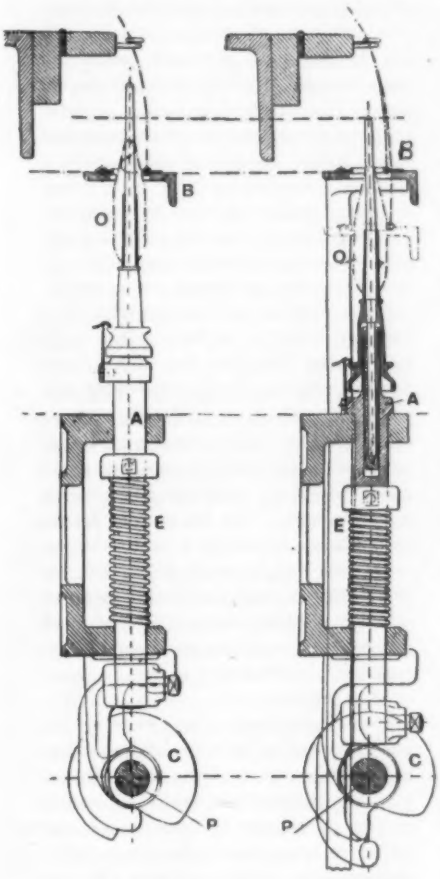


FIG. 2. FIG. 1.

at the instant when the spindles have arrived at the top of their lift. The ring rail is traversed in the usual manner, but the spindle is controlled as follows:—The spindle "A" is connected with a fork provided with a finger, which by means of a compressed spring "E," resting on the one hand against the framework of the machine, and on the other against a projection on the spindle, is pressed continuously against a cam "C" mounted on the shaft "F," which is driven at a regular speed. When the ring rail "B" arrives near the uppermost limit of its traverse, the cam "C" releases the fork on the spindle "A," and the spindle is instantly forced upward by the action of the spring "E," after which the spindle is returned to its original position by the action of the cam "C." The movement of the spindle produced in the foregoing manner is a fairly rapid one, and the yarn is carried away from the nose, as shown, to about half-way down the chase in about one turn of the spindle, thus producing a rapid crossing which takes up the yarn quickly, and owing to the crossing produces a firm, well-bound cop.

Branson 15-16 Automatic Knitting Machines.

The Branson Machine Co., of Philadelphia, have completed and finished special tools for building a 7/8, or 15/16, automatic machine, which, as usual with machines produced by this company, has been very carefully tested and very thoroughly tried for the purpose of eliminating every weakness before offering the machine for sale. This machine is offered to the public with the same confidence in its merits and future success, as that attending the introduction of their ¾ automatic machine, in 1894, which kept their works running night and day for nearly two years. Every objection and weakness of the ¾ automatic machine though they were very few, have, it is claimed, been eliminated in the 15/16 automatic.

We are informed that one operator will run nine of the 15/16 automatic machines on half hose, and will run fourteen machines on string work. The price is the same as the ¾ automatic. It operates with one belt. Upon completion of the heel and toe, it cuts out the splicing thread, and, without stop or alteration, carries down the inoperative needles, and starts upon the cir-

cular work. It makes a gradual and automatic change of the stitch in the ankle of ladies' hose. It is built heavy and strong where weight and strength are required. It has a slight alteration in the picking device, which gives it a particularly satisfactory feature. We are informed by the company that it is built under full authority from the owner of a pioneer patent for picking device, which removes an important element for any expensive litigation or infringement of patent rights.

The company has recently added an exhibition room to their office and factory, No. 596 N. American Street (formerly called St. John Street), where they have the machine on exhibition, and where they are at all times pleased to see their old friends and customers or anyone interested in the manufacture of hosiery. The fact that the Branson Machine Co. have sold their first lot of machines without advertising them, beyond an invitation to the nearby manufacturers to call and see them, is pretty good evidence that the manufacturers who see the machines are pleased with them.

Mercerized Cotton.

This subject has not been exhausted, by any means; in fact, it appears to be in as primary a state of existence as it ever was. Results are well known, due to the process of mercerizing and that of retaining the yarn or goods under tension during manipulation. The reasons for the many changes that are seen are not fully understood, and, until they are, manufacturers will be obliged to work more or less in the dark, without a proper conception of the relation between cause and effect. Scientific investigations are constantly undertaken in the laboratory and in the factory, many of which are of much practical value. According to a German publication, certain well known chemists of that country have endeavored to determine what physical and chemical influences produce the effect obtained by treating cotton according to the method prescribed by Thomas and Prevost, which has been referred to a number of times in our columns. Briefly stated, the observations of these chemists are as follows:

The alkalies in cold solution and at a certain degree of concentration exercise a remarkable influence on cellulose, solutions of caustic soda exceeding 10 per cent. strength modifying the structure of cotton fibre, at the ordinary temperature, in such a manner that the flat filaments are transformed into a thick cylindrical shape with a shrunken central cavity. This effect is manifested in fabrics by a shrinkage in the length, and by a corresponding increase laterally, the fabric at the same time becoming transparent.

These changes are attributable to a decisive reaction between the cellulose of the fibre and the alkali, a reaction occurring in the molecular proportion $C_{10}H_{10}O_{10}$: 2NaHO, and accompanied by combination with water. The compound thus formed is again decomposed on washing with water, which removes the alkali and leaves the cellulose behind in a modified form —viz., the hydrate $C_{12}H_{10}O_{10}H_2O$. If the alkali-cellulose compound be treated with alcohol, one-half of the alkali passes into solution, leaving the remainder combined in the form $C_{12}H_{25}O_{10}NaHO$.

This constitutes the reaction to which the name of "mercerization" has been applied in honor of its inventor, Mercer. It is probable that the modifications undergone by the cotton under the foregoing treatment are partly physical and partly chemical. To the latter belongs the action of the caustic soda, resulting in the formation of a readily decomposable sodium salt, which when washed leaves a hydrated cellulose, with increased capacity for fixing dyes and mordants. The physical change effected in the fibre is undoubtedly due to the alteration in volume, which is connected with the transformation of the cellulose into its sodium compound.

This explanation, however, although

sufficient to explain the phenomena of mercerization in general, falls short when applied to the observations made by Thomas and Prevost, who showed that the fibre when mercerized while under tension, assumes a different aspect. The authors believe they have found an explanation of this difference by microscopical examination of the mercerized fibre.

The fibre of cotton, as is well known, is surrounded by a thin skin (cuticle), which varies in thickness according to the class of the cotton, and has a surface more or less roughened in appearance. This skin can be isolated by dissolving out the cellulose by the aid of ammoniacal copper oxide, a method which displays the well-known phenomena of distension, finally resulting in the rupture of the insoluble skin. Now the microscopic examination of mercerized cotton shows that the fibre, which has then a high silky lustre, and is strongly attacked by bleaching and washing, is entirely destitute of cuticle. The fibre appears quite cylindrical and perfectly transparent, owing to the absence of the rough cuticle, and the conditions necessary to impart a silky lustre are entirely fulfilled. The threads, laid as close together as possible, side by side, form a surface capable of reflecting light. This physical effect is specially due to the absence of the cuticle, and it is therefore evident that the classes of cotton best suited for mercerization are those in which the cuticle is the less strongly developed and the most readily eliminated.

The nature of the cuticle of cotton fibre is not yet thoroughly understood. Witt considers it should be regarded as an oxycellulose, but this appears a priori improbable, because botanists look upon it as a suberous membrane —a hypothesis hitherto unchecked by chemists, there being no definite researches in existence on the composition of cork. Kugler and Gilsen have made some valuable observations, the former having detected a considerable quantity of fat in suberine, and isolated a crystallizable acid—phellenic acid,—from cork; whilst Gilsen has isolated cerine, glycerine, and a new acid—phloionic acid,—as well as suberic acid. This observer having indicated a characteristic reaction of phellenic acid, the authors applied the test to cotton, but their investigations lead them to believe that Gilsen's alleged color reaction is based on some error. On the other hand, from the properties of the products extracted from cotton by treating it with 3½ per cent. alcoholic potash, subsequent to extraction with alcohol, ether, and sodium carbonate, they consider that the cuticle of the fibre is really a suberous substance, the definite proof of this being postponed until a characteristic reagent for phellenic acid shall have been discovered.

The practical significance of this observation is that in all cases the cuticle is dissolved in part by caustic soda, but that the greater portion is separated by the distention of the fibre, which in conjunction with the tension exerted during or after the operation in the Thomas and Prevost process, results in its entire removal.

Other reagents were tried, to ascertain if the same results could be obtained as with soda, and in particular the action of alcoholic soda was investigated.

When cotton is immersed in a 10 per cent. solution of caustic soda in 96 per cent. alcohol, no effect of mercerization is noticeable, even after prolonged exposure to the reagent. When removed from the liquid the fibre at first preserves its original length and appearance; but after being left a short time in the air whilst still damp, the fibre contracts in length and then elongates anew, but is permanently shortened and appears to be mercerized. If subjected to tension after removal from the alcoholic lye, and washed whilst still extended, it furthermore assumes a silky lustre. The effects thus obtainable leave nothing to be desired, in comparison with those produced with aqueous solutions. In this case the mercerization is effected by the moisture of the air to which the

cotton fibre, moistened with the alcoholic solution is exposed; and, in fact, if the operation be carried out in the absence of water and atmospheric moisture, with a solution prepared with metallic sodium in alcohol, and then washing with absolute alcohol, no mercerization takes place.

The water attracted by the fibre moistened with alcoholic solution is that necessary for the formation of the sodium compound of cellulose, which is transformed into hydrocellulose by a larger proportion of water.

When the fibre is boiled in alcoholic lye and exposed to the air, mercerization also occurs, the sodium compound being formed on withdrawing the fibre from the liquid; but apparently boiling increases the amount of cuticle dissolved.

The following table shows how the tensile strength of cotton fibre is increased by mercerization, and in particular by treatment in the alcoholic solution of alkali, whereas the elongation and elasticity are smaller than when an aqueous solution has been used:—

Treatment.	No. of Tests.	Tensile Strength	Elongation.
		Grams.	Mm.
Unmercerized Cotton	1	350	20
	2	356	20
	3	360	22
Cotton mercerized with aqueous soda lye, 35° Bé.	1	530	44
	2	570	40
	3	559	35
Alcoholic 10 per cent. soda lye, cold	1	645	24
	2	690	27
	3	610	33
Alcoholic 10 per cent. soda lye, hot	1	740	33
	2	730	38
	3	690	30

Wool Terms.

It may be of some interest to our readers to know the terms that are used in the Australian wool trade. We give many of them as follows:

Cotted and matted: Twisted together. Terms mean that the flesh side of the wool is matted or felted together, caused by ill-health of the sheep, bad keep, etc., more prevalent in deep-grown wools when badly maintained.

Dingy: Not of good color, as distinguished from bright and clear.

Earthy and Sandy: When earth or sand is present in the wool.

Free and Plump: Not tender; will work well in the machinery.

Fribby: Applied to very bitty locks, or to fleece or scoured wools, where small discolored locky pieces are sometimes intermixed, or where the wool itself generally partakes of this character; also second cuts in shearing.

Healthy, Useful, and Sound: Apply as the words themselves express, when the staple draws out well, and will bear a fair strain.

Kempy: When there are coarse, short, white or gray hairs grown amongst the fine wool—a sign of badly bred sheep.

Kindly: Attractive condition as to the get-up, soft and kindly to handle, with good quality more or less combined; used principally in connection with washed or scoureds.

Loose and Open: Generally applied to ewes and old sheep wools, signifying that the fibres of the staple do not cling together, and have not the appearance of young sheep wool.

Lustre: Brightness. Applicable to combing wools with a rich wavy staple of silvery and lustrous appearance, more conspicuous in wools of deeper growth.

Moity and Specky: Used when the wool contains small specks and particles of vegetable and other matter; often found in the necks and polls of the fleece.

Mushy: When the fibres of the wool hardly hold together; very short in staple, rotten, loose and mushy; mostly found on rumps and hollow of the back, generally among old sheep.

Serrated: Literal meaning of the word is possessing teeth like a saw. The wavy surface in a fibre of wool which so much increases its milling qualities and makes it of value to manufacturers.

Shafty or Lofty: Meaning a plump, bulky appearance, applicable to deep-grown wools generally.

Sickly and Hungry: When wool is

matted, stained, tender, and poorly grown.

Skirty: Wool left on the fleece which has been grown on the belly or skirts and which (for the wool to have been well classed) should have been taken off in the skirting.

Stringy and Roped: Scoured wool which is much twisted or roped in the scouring.

Stumpy: A short staple with broad top; a sign of old sheep's wool.

Suint or Yolk: The fatty secretion from the skin of the sheep which is always associated with the wool.

Cotton Market.

At present writing, the current price for middling uplands is 5 7/16 cents, against 5 3/8 cents last month, showing a slight advance. The trade is more or less nonplussed at the improvement in price, however small it may be, as a decline had been predicted, and operations have been generally consummated on this expectation. The improvement, however, is looked upon as having a substantial basis, not the least of which is the growing appreciation that the market may have been unduly depressed.

We quote from an interesting report that has reached us through a New York cotton broker, as follows:

"In the main, reports indicate that the weather during the past two weeks has been favorable for picking and marketing. The frosts over a considerable section of the cotton belt have precluded the possibility of an average late crop, and from various sections, especially west of the Mississippi River it is claimed that cotton is very difficult of picking, that labor is scarce, and that unless the season be considerably prolonged it will be impossible to gather all of the crop. However at this date the yields are reported very full with the quality of staple of the latter picked improved to some extent. It will be recalled, that due to the unusually favorable weather last year not a small proportion of the crop was blooming on Dec. 1st, and even later, and that picking extended through the late winter, which increased the yield many thousands of bales. From present indications such possibility may not recur this season, as the heavy frosts may indicate an early winter. It is too early to give a final estimate as the weather for two or three weeks will be an important factor. There have been four occasions during the preceding ten years when the proportion of the crop moved from Sept. 1st to Nov. 15th, equaled about this fall's record of over 4,000,000 bales. It is a significant fact that in three of these years the average production was 2,500,000 less than is now claimed to be this year's crop. This shows that the movement for the first ten weeks proves nothing as a rule excepting the fallibility of relying upon it as indicating the crop."

The Congressional elections in November imparted a feeling of confidence that a stable basis for mercantile transactions is assured.

The November circular of the Department of Agriculture gave the average indicated yield of lint cotton per acre at 219 pounds, the State averages ranging from 117 pounds for Florida and 183 pounds for Georgia, to 290 pounds for Arkansas and 325 for the Indian Territory. An addition of about 150,000 acres has been made by the department to its preliminary estimate of the cotton acreage in the Indian Territory. The report of the department was received with some incredulity in New York, and the estimate of the crop based upon the yield of lint cotton per acre was considered so small as to invalidate the correctness of the figures. The department's estimate last year was 181.9 pounds per acre, while the final outturn was about 227 pounds.

The Newburger Cotton Co., Grenada, Miss., in their circular of November, stated that it takes less seed cotton this year to make a bale than any year they have ever known. "Farmers are reporting that they take 1500 pounds of seed cotton to the gin, and

in nearly every instance get over 500 pounds, exclusive of bagging and ties." This company make an estimate of the crop at 11,700,000 bales, supplementing it with the remark that "we are satisfied that the outturn of this crop will be larger than these figures."

Hubbard Bros. & Co., New York, have issued an interesting card showing the highest and lowest price of cotton futures in New York and Liverpool during the last nine years. The extreme fluctuation in cotton futures for 1897-98, in New York, was 2.17 cents, against 2.75 cents for the previous season. The greatest fluctuation during the nine years was in 1890-91, when it amounted to 4.14 cents per pound. The cotton manufacturing industry of New England has made a marked step forward, in the recent absorption of Fall River print cloths by the trade.

We are advised by Stoddard, Haserick, Richards & Company, dealers in Egyptian cotton, Boston, that their early advices from Alexandria represented the market as dull, though prices were ruling very steady, in spite of inactivity. More recent advices show a determined maintenance of prices. This is thought to be due to local speculation, and also to fog damage reports being made the most of.

The latest official report of the Alexandria General Produce Association, is as follows:

"The high temperature during October was favorable to cotton, and to a certain extent increased the yield. Nevertheless, the fields that had already been seriously damaged, by want of water and fogs, did not profit by the heat. The first picking is already finished, and the second is in the way of being so. In general a diminution from last year has been found. As for the third picking which suffered the most, it will be small. Also the yield in ginning is slightly inferior to that of last year. We are therefore obliged to hold to the forecast of our resume of September, and estimate the crop at about 6,000,000 cantars. As regards the quality, the staple of the first picking is better than that of last year, but, in consequence of the fogs, the appearance is not quite satisfactory."

Wool Market.

The wool market in Boston and elsewhere has been in a comparative state of activity during the last month, both in the domestic and foreign article. Prices still remain high, considering the basis that manufacturers are obliged to work upon to meet the views of their customers; still, the American market is below that of the foreign, allowing the proper differences due to customs duties. This is evidenced in the comparatively large exports of foreign wool in bond to markets abroad. These exports have included both Australian and Montevideo wools. At present writing, the state of the market is quiet. A large portion of the wool that has been moved during the past month has been of the medium Territory class, all of which has passed to mill account. In order to move a large quantity of wool in past weeks, considerable concessions in price became necessary, due to various causes, a potent one being that those holding large lines did not care to add to the increasing cost arising from warehouse charges, interest, and the disinclination to renew loans. No further decline is anticipated. Nominally, Ohio XX wool is held at 28 to 29 cents, but actual offers are taken in several instances at 28 cents. Territory wools are moving on the basis of 42 to 43 cents clean, for fine medium, up to 45 cents for fine, and 48 cents for staple. These latter are firm, with a better movement. Ohio delaines command 29 to 31 cents for fine washed. There is a more hopeful feeling in wool manufacturing, and some improvement is noted. Heavy weight samples are attracting considerable attention, and recent purchases of wool have been made in anticipation of a better trade; still, prices are not satisfactory.

Analyses of Cost.

The old school manufacturer took pride in his ability (?) to give an offhand estimate on the cost of any fabric that might be submitted to him, or after a few minutes' rough figuring, name the price he would undertake to duplicate the goods as per sample. Even in the days of wide margins and big profits, it was a hazardous policy and many a big loss has been charged up because of this idea. Manufacturers seemed to think that if they could not tell the cost of fabric by looking at it, they would be set down as not knowing their business. As a matter of fact, the proper calculation of the cost of fabric is a problem that requires considerable time, careful analyses of sample, a thorough knowledge of all the processes of manufacturing and good judgment.

It has been a matter of much interest to study the analyses of some of the leading lines of men's wear at present on the market, for while the margins of profit are not large, yet we find that in the fabrics selling around a dollar a yard, they will average ten cents. This is after making an allowance of twenty per cent. for selling expenses and also proper percentage for the general expenses of a well balanced plant, but not including interest charges for borrowed money. Occasionally, a line shows up even better than this. One line in particular, a cotton worsted selling for 95c., 5 off (14 ounce fabric), figures a profit of about 15c. per yard. A wool cheviot made in Massachusetts 25 per cent. wool and 75 per cent. noils shows a profit of 11¼ cents at a selling price of $1. Of course the conditions prevailing at each mill will modify these figures in every instance, so that the profit might show slightly more or less.

In this particular, analyses were made for a manufacturer who is considering on what line of goods he should put his mill. He is changing his commission account and has visited a number of the leading houses with the view of making new arrangements. He was bewildered by the different advice he received, and in order to get his bearings, procured samples of good selling styles in such lines as his mill is able to make and with the analyses of cost before him, has a much clearer idea of what he can do, and has formed general conclusions of much value.

Many designers are able to figure costs and, in some instances, do so, but, unfortunately, their employers hesitate to entrust them the details of cost of stock, labor and proper allowance for expenses, etc., fearing to give out too much information as to their profits or losses. This may be well enough provided the manufacturer has himself the requisite technical knowledge to work out all the details. It has been our experience that many mill men who are good buyers, good business men and good managers are not good experts in technical textile calculations, and some of them are inclined to belittle the value of such work. In so doing they are ignoring an important factor which contributes to the success of the woolen manufacturer of today.

—In a number of directions a slight improvement in the volume of reorders for spring weights of woolens and worsteds for men's wear has been reported.

—Manufacturers continue to buy quite largely, but at concessions rather greater, especially on fine washed fleeces, Ohio XX being quoted at 27 cents.

—The action of the woad in the vat, it is a matter of experience that the fermentation is of the most regular nature, and is most easily controlled when woad is the principal fermenting agent. So-called "rhubarb woad" is prepared by a treatment of rhubarb, and is much less costly than true woad, but it is so inferior in its effect that its employment is very limited.

COTTON DEPARTMENT.

American Cotton Spinning Machinery.

CHARLES CLIFTON HEDRICK.

23190*
apr. 11. 98.

ARTICLE VI.

(Copyright.)

The friction let-off, by which the laps, on the picker, are caused to be wound firmly and hard, is constructed very similarly by all builders. Three views, a front elevation, a side elevation and a section of a device, for this purpose, are shown in Fig. 32.

The lap, which is wound upon the lap arbor N^2, is held in contact with the lap rolls Y by the racks K and K^1, which bear upon either end of the lap roll. The top of the racks is recessed to receive two rolls A and B, which form roller bearings, greatly reducing the friction and wear upon the lap roll. The lower end of the rack K is in gear with the pinion W, while the rack K^1 is in gear with the pinion D, both of these pinions being secured to the rack shaft G. The gear R, also on the rack shaft, is connected with the pinion O, which is on the hub of the break pulley N, by the gears S and P. These gears turn loose on the shaft L and are held in position by the collars F and H. The break pulley N is free to turn on the rack shaft and is held in position by the collar C. Loose upon the shaft L is the break lever E, which bears against the under side of the break pulley and is kept in contact with it by the weight M. The face of the break lever, which bears against the pulley, is lined with leather.

As the lap increases in diameter, it draws up, on the racks, which are kept from rising by the friction of the break lever against the break pulley. When it has been wound to its full diameter, the attendant presses down upon the break lever, releasing it from contact with the break pulley; the rack may then be raised by turning the hand wheel J on the end of the rack shaft.

In order to bring both racks to the same height, so that the lap will be wound equally in diameter on each end, the pinion D, which gears into the rack K^1, is keyed directly to the rack shaft, while the pinion W, which gears into the rack K, is connected to the rack shaft by a lug, projecting out between the arms of a dog, or carrier T, which is keyed to the rack shaft. In the arms of the dog are adjusting screws T^1 and T^2, which bear against the projecting lug of the pinion, by turning these screws, the pinion may be moved a slight distance, around the rack, shaft in either direction and the rack K brought exactly in line with the rack K^1.

On warm, damp days, the leather facing of the break lever adheres closer to the break pulley, and it is often necessary to move the weight M in from the end of the break lever, thus reducing the pressure of the lever against the break pulley. Sometimes it is necessary to remove the weight entirely, as too great pressure tends to break the lap rolls, and to wind too hard laps, which causes them to split when unrolled.

Care should be taken in oiling to avoid getting oil upon the break pulley, as the friction is rendered well-nigh useless, being so slight as to cause the laps to be wound too soft.

It is necessary that the laps, particularly those from the finisher picker, should be as free as possible from any foreign substances, such as nails, pieces of hoop iron, etc., which, if they by accident should be wound into the lap, would cause considerable injury to the card when fed into it. Most pickers are provided with some

form of device to prevent this, and which is called an automatic safety stop. Two views of one are shown in Fig. 33, a side elevation and a partial front elevation.

The calender rolls, cages and feed rolls are all driven by the pinion S, through the gear R, which is upon one of the calender rolls, consequently by disengaging these gears the calender rolls and parts connected are stopped. This is accomplished in the following manner: The cotton, after leaving the

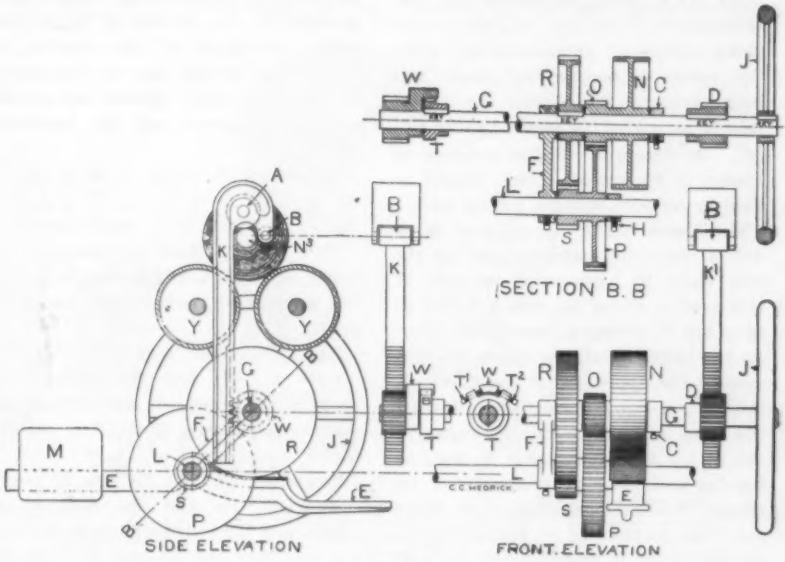


FIG. 32.

cages, passes between the top and second calender rolls L and N. Resting on the top of the bearings, at either end of the top calender roll, is a lever F, called the top lever. The rolls, which are heavily weighted, are connected to the weight by the top lever, the rod H and the weight lever G, upon which is the weight J. The weight lever has its fulcrum at K. Directly above a part of the weight lever is the knock-off lever A, which turns on the shaft C, and has a screw D near its inner end, by which it is adjusted, and which bears against a lug, projecting from the weight lever. When it is in its normal position, its outer end is just clear of the under side of the knock-off latch E. This latch turns on the stud T, and has a notch B^1 in its upper end by which the drop lever M, that carries the pinion S, is held in position. Should any foreign substance be drawn between the calender rolls, the unusual thickness of the lap, caused by it, would lift the top calender roll, and through the connection, just described, the knock-off lever would be raised and its outer end brought in contact with the knock-off latch which would, in turn, be moved to one side, allowing the drop lever to fall, disengaging the gears S and R, and stopping the calender rolls. The adjusting screw enables the picker to be set so that a very slight increase, in the thickness of the lap, will cause the picker to knock off, as it will when the evener fails to take care of unusually heavy laps.

In order to get the best results, the laps should be as near the same weight as possible, not that each square yard of lap shall weigh the same, but the total weight of each lap must be within the limit of one-half pound variation from the weight of a forty-pound lap. In some cases, for very fine work, particularly with

single carding and the revolting flat card, each lap, from the finisher picker, is weighed and if found to vary more than one-half pound from the weight, which has been established as a standard, is not allowed to pass to the card room. Sometimes, every other lap is weighed, often the laps are weighed every hour, while in some mills they do not bother to weigh them more than once or twice a day.

The weight of the lap is governed by the number of yards that it contains, this being measured by the revolutions of the lap roll, the picker being stopped, automatically, after the required number of yards has been wound. The device, by which this is regulated, is called the knock-off. A diagram of the gearing is shown in Figure 34, which should be used in connection with Figure 33.

The knock-off, or change gear K, is driven from the calender roll by the side shaft B; loose upon the hub of this gear is a dog W, which is driven by a pin V, forming part of the gear. As the latter turns, the dog is brought against the upper end of the knock-off latch E, moving it out and allowing the drop lever M to fall, disengaging the pinion S and the gear R, and, as the dog assumes a vertical position, by reason of being loose on the hub of the gear, the picker can be started immediately, after it has knocked off, and the lap has been removed. The knock-off gear makes one revolution for each lap wound, so a change in the number of teeth it contains, gives a different number of yards in a lap.

When the weight per yard and the total weight of the lap have been established, the constant number, or factor, by which the number of teeth in the knock-off gear is calculated, may be figured. The lap rolls are 9 inches in diameter, or 28.27 inches in circumference, therefore 1.27 revolutions would be required to wind one yard, thus, $36 \div 28.27 = 1.27$.

On the end of the lap roll is a gear of 37 teeth which is driven from a pinion of 18 teeth. Compounded with the pinion is a gear of 73 teeth, which is driven from the calender shaft by a pinion of 14 teeth. On the right end of the calender shaft is a pinion S of 13 teeth, which drives the gear R of 80 teeth, while on the hub of the latter, is a single-threaded worm which drives a gear of 35 teeth, which is upon the side shaft. On the opposite end of the side shaft is a pinion of 18 teeth which drives the knock-off, or change gear K, through the intermediate gear of 30 teeth.

To find the factor (Rule 1), multiply the drivers together and divide their product by the product of the driven gears multiplied by the number of revolutions of the lap roll necessary to wind one yard, leaving out all intermediate gears and the knock-off gear.

Example: $(35 \times 80 \times 14 \times 18) \div (18 \times 1 \times 13 \times 73 \times 37 \times 1.27) = 705600 \div 802683.18$ or 0.879 (factor).

Rule 2. To find the number of yards in a lap, multiply the factor by the number of teeth in the knock-off gear.

Example: $0.879 \times 30 = 26.37$ yards.

Rule 3. To find the number of teeth in the knock-off gear, divide the number of yards in the lap by the factor.

Example: $26.37 \div 0.879 = 30$ teeth.

Rule 4. To find the number of yards in a lap, without using the factor, multiply the number of teeth in the knock-off gear by the product of the drivers and divide this by the product of the driven gears multiplied by the number of revolutions of the lap roll necessary to wind one yard, leaving out all intermediate gears.

Example: $(30 \times 35 \times 80 \times 14 \times 18) \div (18 \times 1 \times 13 \times 73 \times 37 \times 1.27) = 21168000 \div 802683.18 = 26.37$ yards.

The weight of the laps, from the finisher picker, depends upon the production required, the counts of yarn it is desired to make and the class of cotton used. It will run from ten to sixteen ounces yer yard. The laps, on the apron of the finisher picker, will average about fifteen ounces per yard, and as there are four laps on the apron at one time, the combined

weight of the laps, entering the finisher, is sixty ounces per yard, and, as the weight of the lap from the finisher must be between ten and sixteen ounces per yard, it is evident that some means must be employed to reduce this weight to that required. This is accomplished by introducing a certain amount of draft between the feed rolls and the lap rolls. By the word draft, as applied to cotton machinery, is meant the ratio of the length of the lap, which passes the lap rolls in a given time, to the length, which passes the feed rolls in the same time. Thus, if the circumferential velocity of the feed rolls is twenty-five feet, while, in the same time, the velocity of the lap roll is one hundred feet, or four times as much, we have a draft of four, and it follows that, if the combined weight, entering the feed rolls, in sixty ounces per yard, the weight, being delivered, will be one-fourth as much, or fifteen ounces per yard.

We will, for the sake of making this clear to those who are not familiar with the subject, call the weight of each of the laps, on the apron of the finisher, sixteen ounces per yard, and that of the lap, being delivered by the finisher, fifteen ounces per yard. The draft would be found in the following way.

Rule 5. To find the draft, multiply the number of laps on the apron by the weight per yard, and divide the product by the weight of the lap being delivered.

Example: $(4 \times 16) \div 15 = 4.2$ draft.

Rule 6. If the draft is already known, and it is desired to find the weight of the lap, being delivered, multiply the number of laps on the apron by the weight per yard, and divide the product by the draft.

Example: $(4 \times 16) \div 4.2 = 15$ ounces, weight per yard.

After the draft has been calculated —which in this case we have found to be 4.2—the draft factor, or constant number, must be found, by which the number of teeth, in the draft gear, may be determined. A diagram of the gearing, of a finisher picker, is shown in Figure 35.

The feed roll is 2⅛ inches in diameter, and has, upon the end, a spur gear of 12 teeth, which is driven, from

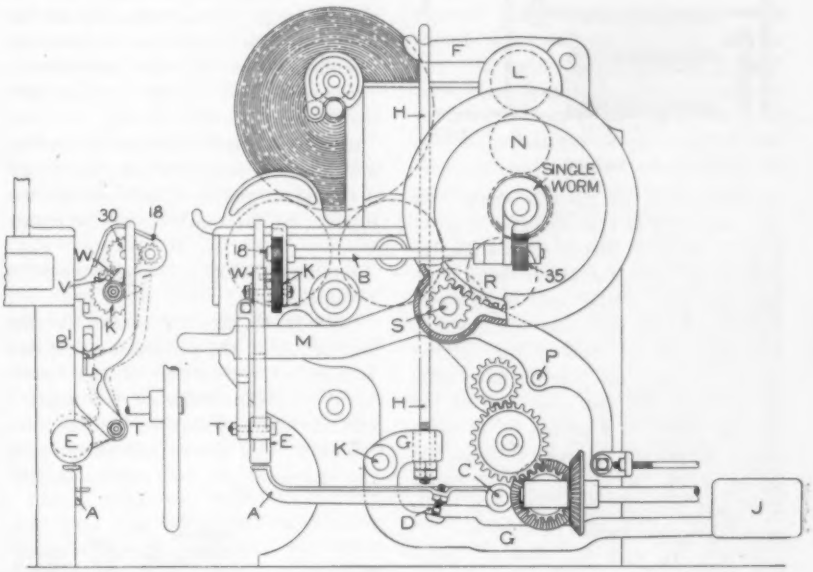


FIG. 33.

the evener roll, by a gear of 16 teeth. Compounded with this gear is one of 28 teeth, which is driven from the apron roll, by a gear of 20 teeth. On the outer end of the apron roll, is a worm gear of 85 teeth that is driven by a single-threaded worm which is upon one end of the evener cone. The diameter of the evener cone is taken, at a point midway of the ends, and is 3¼ inches. The cone is driven from a

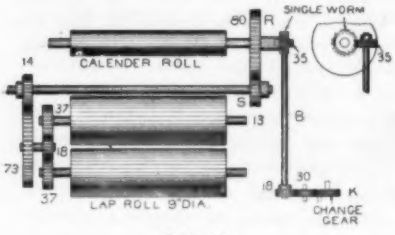


FIG. 34.

ten-inch drum, on the side shaft. On the front end of this shaft, is a bevel gear of 54 teeth, driven from a similar gear of 40 teeth, the latter being compounded with a spur gear of 30 teeth, which is driven from the draft gear E (which is on the end of the driving shaft) through an intermediate gear of 60 teeth. On the other end of the driving shaft, is a pinion of 14 teeth which drives the lap rolls through the gears of 76, 14, 73, 18 and 37 teeth. The last gear is upon the lap rolls, which are nine inches in diameter.

Rule 7. To find the constant number, or factor, multiply the diameter of the lap roll by the drivers, and divide the product by the product of the diameter of the feed roll, multiplied by the driven gears, leaving out all intermediate gears and the draft gear.

Example : (9x18x14x14x30x54x3¼x 85x28x12) ÷ (2¼x37x73x76x40x10x1x 20x16)=4774497436800÷55835072000 =85.51.

Rule 8. To find the number of teeth in the draft gear, divide the draft factor by the draft.

Example: 85.51 ÷ 4.2 = 20 teeth.

Rule 9. To find the draft, when the number of teeth in the draft gear is known, divide the draft factor by the number of teeth in the draft gear.

Example: 85.51 ÷ 20 = 4.2 draft.

Rule 10. To find the draft, without first finding the factor, multiply the diameter of the lap roll by the drivers, and divide the product by the product of the diameter of the feed roll multiplied by the driven gears and the draft gear, leaving out the intermediate gears.

Example : (9x18x14x14x30x54x3¼x 85x28x12)÷(2¼x37x73x76x20x40x10x 1 x 20 x 16) = 4774497436800 ÷ 1116701440000=4.2 draft.

Rule 11. To find the speed of the beater, multiply the speed of the counter shaft by the diameter of the pulley A, and divide the product by the diameter of the beater pulley B.

Example: (500 × 24) ÷ 8 = 1500 revolutions.

Rule 12. To find the speed of the fan, multiply the speed of the beater by diameter of pulley C, and divide the product by the diameter of the pulley D.

Example: (1500 × 5) ÷ 8 = 937.5 revolutions.

Rule 13. To find the factor for the production of the picker, multiply the number of revolutions of the beater by the circumference of the lap roll and the drivers, leaving out the feed pulley F, and divide the product by the diameter of the pulley, on the

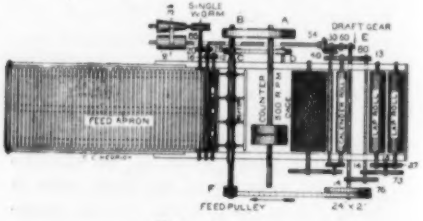


FIG. 35.

calender head, multiplied by the driven gears and 36 (number of inches in a yard.)

Example : (1500x28.27x14x14x18) ÷ (24x76x73x37x36) = 149604840 ÷ 177358464=0.8435 factor.

Rule 14. To find the production of the picker, multiply the factor, the diameter of the feed pulley F, the minutes run per day, and the weight of

the lap per yard together, and divide the product by ounces per pound.

Example. (0.8435 × 4½ × 600 × 15) ÷ 16 = 2135.10 pounds.

Principles of Cotton Spinning.

ROBERT CUNLEFFE.

(Continued from August.)

In our last article we referred at some length to side ground, and hard and tempered steel wire. We wish it to be perfectly understood, that all wire on a carding engine, needs to have a number of serrations; in other words, it must not be perfectly smooth, if so, it would have no holding power, and no proper carding would take place. The teeth must have a certain amount of holding power, and the question is, how to get this power without injury to the fibre of cotton. We have had occasion to refer to the waxy covering of the fibre of cotton. If this waxy covering be removed, then the fibres, and also the yarn made from them, lose their elasticity and lustre, the natural twist, and to a small extent the strength also. And the serrations produced on a hard and tempered steel and side-ground tooth, are much coarser than those produced on an iron or mild steel.

This, I think, will be patent to every one who has seen carding engines with side ground and hard and tempered steel at work. If you examine the coiler tops, just as the sliver is passing down the hole, you will discover a white powder. This clearly proves that the waxy covering is being removed; and all mills having their cards covered with this wire find it necessary to use a wire stripping brush. This brush, by constant stripping, has smoothed the wire sufficiently to prevent this recurrence.

The late Mr. Dobson in his very able work on the carding engine, after giving a number of diagrams showing the points of different kinds of wire, says, "the inevitable conclusion that will be drawn from a very careful inspection of these diagrams is, that in all side ground wire, there is a very large amount of surface asperities capable of injuring the delicate wax walls of the fibres. And that when these are removed, by either flattened wire or polishing the side ground wire, a very considerable loss of carding power is sustained."

Proportions of wire to surface, per square inch: Round wire ⅛ of a square inch is occupied by the upper surface of the wire; side ground wire $^1/_{25}$ of a square inch is occupied by the upper surface of the wire.

Length of serrations of wires in contact with cotton per square inch: Round wire 10¼ inches; side ground wire 3¾ inches. This will show that, as soon as the ground wire has its asperities removed by polishing, the holding power for proper carding purposes is reduced very considerably, as compared with the ordinary wire.

Of course different points of wire are produced by the different modes of grinding. What is called the dead roller, that is the roller covering the whole length of flat, grinds entirely from the back of the tooth, and produces what is called the chisel point, and this mode of grinding generally produces a hook on the point of the wire which is very objectionable indeed. When a card is newly covered, the long or dead roller will get up the wire sooner, but this should be changed to a traveling disc to grind the carding tooth. This disc will grind what is called a diamond point, and this kind of point, so far, is the best form of point for producing good work.

But on most of the cards at present working, this traveling disc has one fault, that is, it dwells an instant at each end while in the act of reversing. The writer pointed out the evil of this years ago, but, until very recently, no alteration has taken place. Now these discs are being made to travel clear off the wire before changing. Difficulties have been experienced by carders using the traveling disc, changing before clearing the wire, by supposing that the wire would be

ground lower at the ends where the disc dwells, than in the middle; while the reverse is the case, and the reason is this: The disc, in passing over the middle of the cylinder, doffer or flats, grinds the sides of the tooth, as well as the back, while it grinds the back of the tooth, only, at either end where it dwells an instant in the act of reversing. The abrading action of the disc on the tooth in the middle is double, and in this way it grinds a diamond point; but at each end where it dwells, the tooth is all ground from the back, producing what is called a chisel point, and its abrading action is only half of what it is in the middle. And it is necessary sometimes to put the hand strickle on the ends, to get the wire all one height, the full width across. In setting the cylinder and doffer under these circumstances, it is necessary to gauge all across the wire, and not to depend upon the ear.

Mr. Gilbert French, in a paper read some years ago, says: "Anyone, who reflects upon the carding of cotton, must see the necessity of as much as possible keeping the coat of the fibre entire." He recommends that every carder should be provided by his employer with a magnifying glass, for, without this, he says, it is impossible for him to know the real state of his cards. He speaks strongly on the grinding of a diamond point, which he likens to the point of a tool for turning iron, and says great care should be taken to get the point up sharp, and not leave it the least bearded on the point or edge, which I understand to mean the hooked point that certain modes of grinding produce, and which I have already pointed out in grinding a chisel point. There are different kinds of emery used on the grinding rollers, as coarse or fine.

For facing up new wire I have always found No. 12 or No. 14, which is rather a coarse emery, do very well. But when putting the carding point on, and also when getting up the point again after working for a time, and when using the traveling disc, No. 24 emery should be used, which is a much finer emery, and the roller should be put on the wire as lightly as possible. Never hurry in your grinding if you wish to do good work.

We have before referred to the method adopted for covering cylinder and doffer. Let us now say a few words about covering flats. The nearest possible position of the card clothing on the flats and cylinder to each other, can only be obtained when the clothing, when fixed on the flats, show exactly the same tension on every part of each flat, both lengthwise and breadthwise, because, if a single flat of the whole series has a different tension from the others, all the other flats would, in consequence, have to be adjusted according to the smallest space between it and the cylinder, impairing the quality and quantity of production. Consequently it will be clearly seen that the method of fixing the card clothing to the flats has a great deal to do with the good working and production of the card.

Different methods have been adopted at different times in different countries for fixing the clothing to the flats. It will not be uninteresting to refer briefly to a few of these methods. Let us preface by saying that the means adopted in fastening the clothing to the flats must satisfy the following conditions. First, the fastening used must allow of a uniformly equal tension of the clothing, and must maintain the same unaltered. Second, the methods of fixing must be such, that no difference can be observed in putting on the clothing of one flat from another. Third, the edges of the clothing must be completely covered, so that they will not get unraveled. Fourth, the greatest possible working surface must be obtained by the method of fixing, so that it approaches as nearly as possible the surface of the flats. Fifth, the method of fixing must be adapted for all kinds of flats.

The various methods of fixing the clothing to flats of carding engines,

may be classified as follows: First, those where the clothing is simply nailed on. Second, those where, for the purpose of clothing the flats, holes are provided, which are destined to take up the tension of the clothing. Third, those where, without making any holes in the flats, the fixing of the clothing is made by means of steel strips, which enclose the edges of the clothing as well as the back of the flats.

First the nailing on. Nailing on the clothing to the flats can only be done when the flat which is to take up the tension of the clothing is made of softer material than the nails used for fixing. For this reason this method is only used to those cards having wooden flats. The flat is fixed down firmly, and the clothing stretched lengthwise along one side and nailed down by nails with large heads, placed as close together as possible on to the wooden flat. The breadth of the clothing is somewhat larger than that of the wooden flat, so that the clothing can be easily gripped on the other side with a pair of tongs, thus being stretched out breadthwise and then nailed down to the wooden flat. The tongs may be constructed to get hold of the whole length of the flat at once, or only a part of it. In the latter case a number of consecutive stretchings of the clothing breadthwise will be required, for which the tongs will be opened after nailing on the stretched part, and moved along lengthwise of the clothing by the breadth of the tongs. When both sides have been nailed on lengthwise, the clothing is cut off to the width of the flat. The wooden flat has the fault that it is subject to expansion and contraction, in consequence of which metallic flats are now nearly the only ones used. Owing to the large size of the nail head, the working surface in comparison to the total surface of the flat, is smaller, which prevents the best use being made of that part of the cylinder which is covered by the flats.

—Growing of flax in Ireland bids fair to become an extinct industry.

Egyptian Cotton in Texas.

We have received a letter from W. H. Wentworth Karney, Gonzales County, Texas, relating to his recent experiments with the growth of cotton from Egyptian seed, sample of which he nas forwarded to us for examination. The sample shows a high quality of cotton, in length of staple and spinning qualities, such as are needed in the manufacture of fine counts. Mr. Wentworth has made exhibits of his cotton at several fairs in his State, for the purpose of demonstrating the proper handling of this fibre from the boll to the gin. Mr. Wentworth feels entirely satisfied with the results, and he expresses himself in favor of Texas soil as being quite as favorable for the growth of this cotton as the fertile valley of the Nile. His method of cultivation is that of selecting the seed from the best bolls, from the choicest stalks, for the succeeding year's planting. He offers the seed for sale, at the rate of 30 cents for a quantity sufficient to plant an acre.

Roving Breakers.

Editor Textile World:

I wish to thank you for the article which you published in the November number of the Textile World having reference to roving breakers. At the same time I beg to acknowledge my indebtedness to James P. Tolman, the president and manager of the Samson Cordage Works, Shirley, Mass., whose deep interest and untiring efforts to perfect roving breakers is what has brought them to their present efficiency. He has invented many of the most important details of our patented mechanisms, and his name should have more prominent connection with them than mine.

H. D. MARTIN.

Nashville, Tenn., Nov. 21, 1898.

—So far as the cultivation of the rhea plant goes, no difficulties present themselves.

The Cause and Prevention of Steam in Slasher Rooms.

The cause of steam in the slasher room is, of course, not far to seek, and is to be found in the large amount of water which goes to form the principal ingredient of the size. The high temperature of the size itself and the influence of the drying cylinders, result in the eventual evaporation of all of this water. Unless otherwise prevented, it naturally distributes itself throughout the room, but with the form of hood enclosing the entire machine which has heretofore been commonly adopted, this moisture-laden air may, to some extent, be prevented from mingling with the atmosphere of the room. But air has a wonderful faculty of working through the crevices so that the moisture may very generally pervade the room.

As the result of inquiry from different mill agents, the information contained in the accompanying table has been secured.

Designation of Mill.	Average Temperature in Slasher Room.	Pounds of Water in Size Used per Slasher per Hour.	Remarks.
A	89°	185	Heavy Work.
B	89	200	Light Work.
C	93	200	45 fifty-yard cuts of No. 28 yarn per hour.
D	80	250	47 fifty yard cuts of No. 30 yarn per hour.
E	75	160	
F	90	330	
G	90	185	
H	80	275	
I	70	155	
Average	84°	215.5	

From this it is evident that in round numbers the average temperature of slasher rooms was 84°, and that about 215 pounds of water must be evaporated per hour. The problem presented is to provide a sufficient amount of air to take up this moisture. The accompanying hygrometric chart serves to make clear the conditions under which air of different temperatures will take up moisture. The line representing dew point shows the limit of the grains of moisture which the air can take up at a given temperature, thus in round figures, it appears that at 60° temperature the air can take up 6 grains of moisture, while at 100° it has a capacity for about 20 grains.

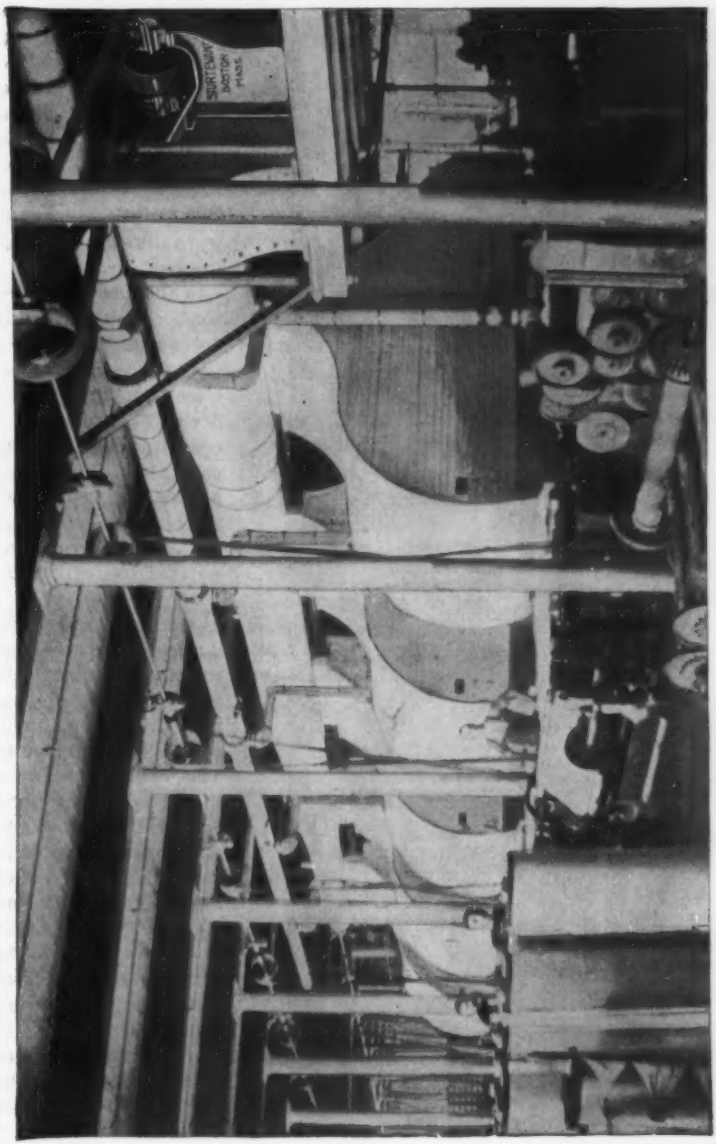
The actual conditions existing in a slasher room may be clearly shown by the following calculations based upon the fact that the average relative humidity of air at 70° is about 70 per cent.

The weight of a cubic foot of air at 70° is .07425 lbs., the water alone weighing .001153 lbs. But air at 84°, the average temperature of these slasher rooms, weighs only .072597 lbs. per cubic foot, while the vapor it will contain amounts to .0015778 lbs. That is while the weight of a cubic foot of air has decreased over 2 per cent., the capacity for absorbing moisture has increased about 37 per cent. Therefore if the original humidity of the air at 70° was 70 per cent., the actual amount of vapor in it would have been .0008071 lbs. If this air be heated to 84° it can take up .0015778—.0008071 equals .0007707 lbs. to each cubic foot before becoming saturated. Hence the amount of air required to absorb 215 lbs. of vapor must be 215÷.0007707, equals 278,960 cubic feet.

If a cubic foot of saturated air at 84° be cooled at all, some moisture must be deposited. By the chart, for instance, it is evident that if air at 84° temperature and having only 80 per

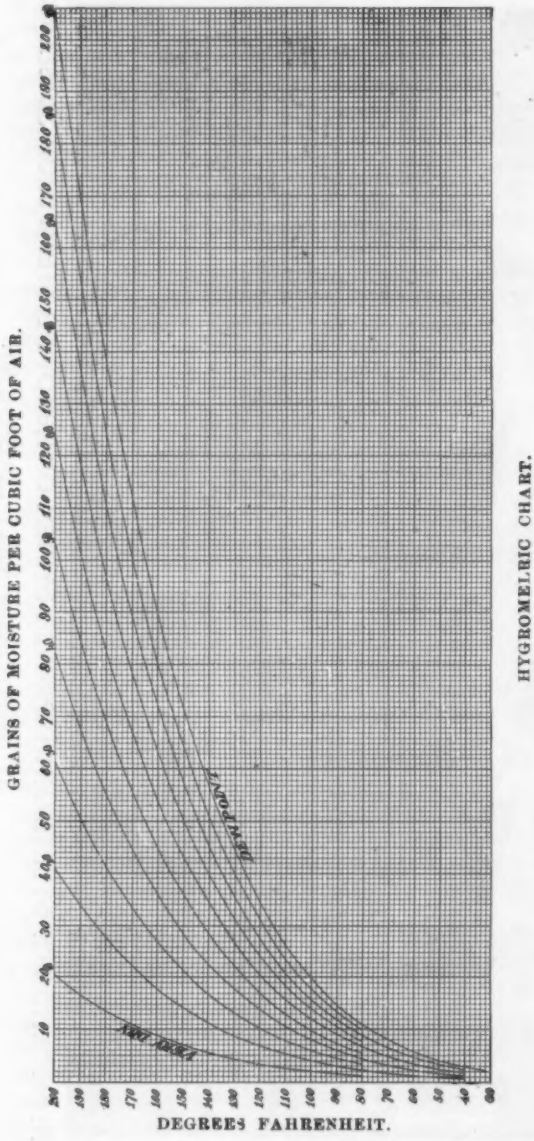
cent. saturation, be cooled to 77°, the dew point will be reached and moisture will be deposited.

These figures all point to the necessity of positive means for removing the air from the slasher hoods as rapidly as it becomes laden with moisture. During warm weather this necessity is not so apparent because the temperature is high and the moisture laden air is not so easily cooled, but in winter, the external temperature being so much lower, is very certain to have its influence, causing a deposit of moisture which is always a source of great annoyance. For this reason the utility of natural ventilation is not always in evidence.



APPLICATION OF STURTEVANT IMPROVED SYSTEM OF REMOVING STEAM FROM SLASHERS.
AT ANDROSCOGGIN MILLS, LEWISTON, ME.

The B. F. Sturtevant Co. of Boston, Mass., to whom we are indebted for the accompanying illustration, and some of the data herewith presented, has made a careful study of this subject and is introducing its exhaust fans for direct-connection to slasher hoods, thereby securing positive and ample circulation of air.



An interesting example of this system is shown in the accompanying engraving from a photograph taken in the slasher room of the Androscoggin Mills, Lewiston, Me. In this case the hoods were already in place and connected to ventilators above. The system of piping and the fan was substituted and connections made as shown. The fan discharges upward directly through the roof.

In the case of a new slasher plant it is only necessary to hood in the size box and to enclose the top of the drying cylinder in a comparatively small galvanized iron hood so as to collect all steam given off when the wet yarn first touches the cylinder.

—It is clear that American success in the late war with Spain was due chiefly to brain work, or intelligence, behind the guns. The contrast between the American and Spaniard, in mechanical dexterity and skill, was shown in all of the engagements on land or water. The Spaniard seems to be suffering from arrested mentality, and living upon the records of Spanish superiority of two or three centuries ago. We believe that Spain and China will be benefited in the long run, because of their recent defeats in war. Certainly it is to be hoped that some good may be derived from their misfortunes.

WOOLEN DEPARTMENT.

Ingenuity in Modern Textiles.

ARTICLE IV.

CHARLES E. WILES.

(Copyright.)

In order to understand more fully the purport of this article, it would be well if the previous article was perused. As demonstrating the diversity of patterns which may accrue from one weave, either by different arrangements of colored yarns, or by even the same arrangement of threads, only a slightly altered position of the weave in relation to them, Fig. 8 is shown, the plan for which is given in Fig. 9. The name usually conferred upon this crossing is split Celtic or hopsack. The reason for this will be deduced from the fact that this weave, although the same practically as in the previous example, is split in order that those pairs of threads which work similarly in the plan may differ in color when woven.

For the production of effects similar to this, the following instructions and particulars are suggested:

Warp:

For 48 threads: 1 thread, 22 skeins wool, black, and 1 thread, 22 skeins wool, dark gray shade.

For 48 threads: 2 threads, 22 skeins wool, black, and 2 threads, 22 skeins wool, dark gray shade.

24s reed 2s.

Weft:

Same as warp;

48 threads and 50 picks per inch.

Shrinkage at fulling about eight per cent. the cloth being finished with a short and soft velvety surface.

Another standard weave which has already been referred to is that usually termed the "Mayo," complete on eight threads and picks, and of which an illustration is afforded in Fig. 10. This crossing, even when not made a vehicle for color ornamentation is q very useful one for the class of materials under consideration, giving as it does an interesting broken twilled effect in combination with a structure of adequate stability. But its appearance may be rendered much more attractive by employing a series of warp and weft colors in conjunction with it. One instance of this is furnished in Sketch, No. 11, which represents the effect produced by warping and wefting this weave, two dark, two light. The same weave, slightly differently arranged with an additional checking is seen in design 12, and the order of threads being retained without alteration, an appearance is produced in the cloth approximating closely to that of sketch 13. Owing to the small extent of pattern visible here the effect is not so readily gauged, as when a view of a larger piece is obtainable, nor is the interest provoked by it equal in any respect to that afforded by the fabric itself.

Weaving particulars for Design 12:

Warp:

Two threads, 18 skeins wool, dark brown shade, and 2 threads, 18 skeins wool, medium brown shade.

10s reed 4s.

Weft:

Same as warp.

40 threads and picks per inch; 8 per cent. shrinkage and ordinary cloth finish.

The fabric whose surface appearance has been sketched in Fig. 14 partakes, as will be readily inferred, somewhat of a hair line character, and special reference is here made to it by reason of the ingenious yarn manipulation which has been practised in order to produce the two different kinds of stripe effects which are visible. The loom plan for this style is,

throughout, the simple four shaft broken swansdown, sometimes called the four shaft sateen, several repeats of which are indicated in the accompanying design, No. 15. Now in order to produce such an effect in combination with this weave it is necessary for the warp to be drawn two of one color and two of another, and this is the method here pursued, the weft being alternate picks of each shade. But it will be plainly evident that this procedure would not, ordinarily, give a double stripe appearance like that in Fig. 14. This feature has been made possible by a variation in the sizes and not the orders of the yarns, which, in company with other particulars necessary for reproduction, are here appended:

Warp:

For 20 threads: 2 threads, 20s worsted, dark gray shade, and 2 threads, 20s worsted, medium gray shade.

For 40 threads: 2 threads, 20 skeins wool, dark gray shade, and 2 threads, 20 skeins wool, light gray shade.

Reed, 13 dents per inch. The worsted to be five ends in a dent and the woolen four ends.

Weft:

1 pick, 20 skeins wool, light gray shade; 1 pick, 20 skeins wool, medium gray shade.

45 picks per inch.

It will become at once evident that the 20 skeins woolen yarn, with an equivalent of 5120 yards to the pound, will make a much bolder striped effect than the 20s worsted which is a great deal finer thread, there being no fewer than 11,200 yards of it to the pound. Such a principle as this is capable of being enlarged upon very extensively and furnishes a method by which, with a little skill, many interesting ranges of goods might be produced.

Nothing has thus far been said relating to that abundant and highly important class of goods known technically as "double plains," but space will only permit of a brief notice being accorded them here. They will, no doubt, receive further attention in treating of other makes of textures in which they are prominent. A "double plain" structure is, as the designation would imply, a fabric compounded of two plain cloths, one woven above the other and the first usually creating a contrast in color with the second. This weave is frequently resorted to in the production of striped trouserings, the stripe being obtained by reversing the positions of the two cloths at intervals which are dependent upon the desired width and arrangement of the lines of color forming the pattern. It is not possible to obtain more than four distinct colors in a striped pattern of this class, and this number is only procurable by arranging the weft yarns in such an order in connection with the plan that they shall float over threads of their own color in the warp.

For instance, supposing a stripe was required having a surface arrangement of four threads dark and four light, and the warp for such fabric had been drawn one dark, one light, right across, it would be necessary in the first eight threads to bring the dark half to the top and interweave them with dark weft, at the same time making a light cloth underneath with the remaining light threads in conjunction with light weft. The second portion of the stripe with four threads of light on the face is simply the previous one reversed. Plan 16 would furnish the requirements for such a texture, and the method of constructing it has purposely been made as apparent as possible, the letters "D" and "L" indicating dark and light yarns respectively. The threads and picks on which the solid black squares occur are weaving the face texture, and a little investigation will show that the positions of these threads and picks are reversed every eight threads. The dots are the plain intersections for the fabric on the back, and crosses represent the sinking of back warp under the picks which form the face. Taking, therefore, the first pick, which is dark, it will be noticed that for the first eight threads it is de-

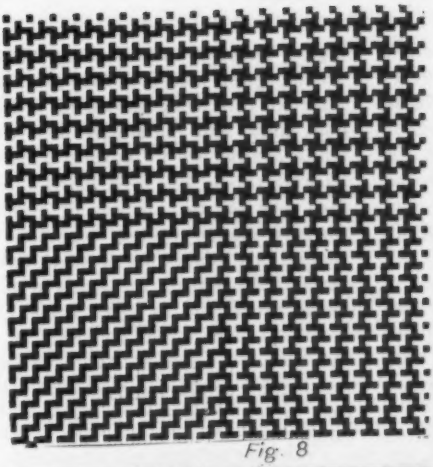


Fig. 8

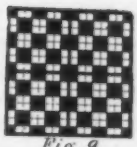


Fig. 9

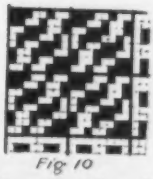


Fig 10

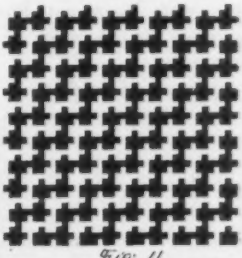
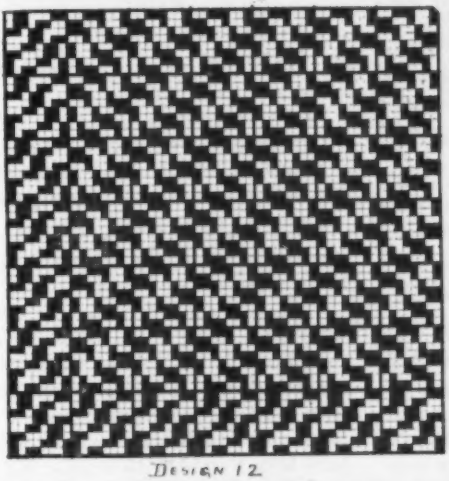
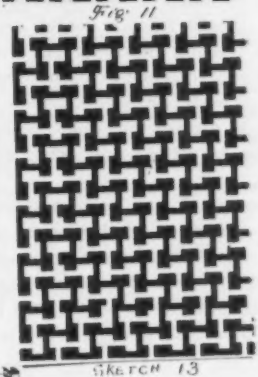


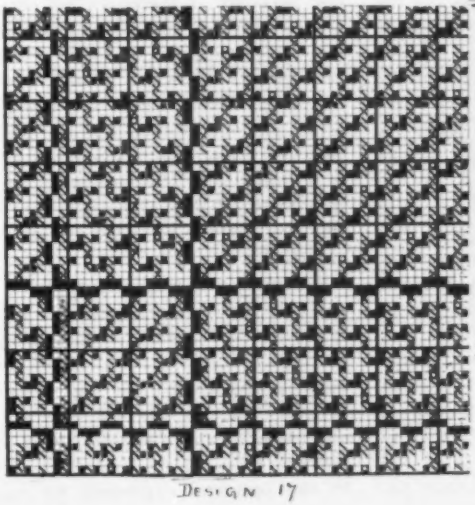
Fig. 11



Design 12



Sketch 13



Design 17

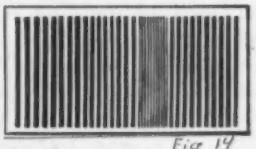
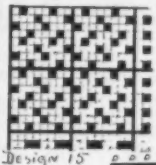
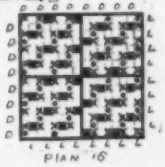


Fig 14



Design 15



Plan 16

pressed under all the light threads whilst in the second eight it covers them all. The second pick being light, weaves plain with the light threads in the first eight and also covers all the dark threads, whilst in the second eight though still weaving plain with the light threads, it is covered by all the dark ones.

No difficulty need be experienced in producing elaborations of this principle, for so long as the designer watches that his weft does not flush over wrong colors in the warp he cannot get far astray.

The last style of goods to be treated of here also holds an important position among the textiles which are at present being considered, and its importance is such as to merit some reference being made to it, however brief and incomplete that reference might be. These fabrics, which are chiefly of a coating character are technically termed "cut cloths," on account of the sharp cuts or well-marked furrows which appear on their faces sometimes as stripes and often as checkings.

Design 17 has been prepared with the object of rendering in as clear and simple a manner as possible, the actual method of constructing a typical example of its class. The fabric is a double one, that is, there is a complete series of yarns for both the upper and lower surface. The threads and picks are arranged two of face and one of backing, the weave for the face being ordinary two and two twill, and that for the under side plain. A description of the various marks which have been employed in the building of the design should at once make any point whereon opinion was previously undecided, quite intelligible. The solid black marks working in threes in both a warp and weft direction are the cutting threads and picks, and these are the ones immediately responsible for the incised markings on the surface of the cloths; the smaller solid squares indicate the four-heald twill, and the crosses the plain weave—the latter of course, being for the back. The backing threads are depressed where all face picks are inserted, this being shown by a diagonal mark, and the square dots with white centres are to indicate where a backing thread has been lifted over a face pick for the purpose of binding the two cloths securely together, although this item is not of such importance if the cutting yarns are in moderate proximity to each other. A wearable cloth might be produced in this weave, suitable for a vicuna coating, by employing counts of yarns and other weaving particulars as below.

Warp:

All 2/36s, black (worsted).
33s reed 3s.

Weft:

30 skeins, black.
96 threads and 80 picks per inch.

Shrink eight to ten per cent. and finish with a surface moderately raised.

There has been a general tendency during late years, and one which was never more clearly evidenced than at the present time, to adopt for wear, fabrics belonging to the worsted class in preference to those made from woolen yarns. So largely has this been done that in many cases its effects upon the woolen manufacturer have been well nigh disastrous, and in the majority of instances his outlook leaves ample scope for improvement. On the makers of such world-renowned fabrics as Scotch tweeds for men's wear, which are excellent alike in color, finish and durability, this veering of public favor has probably fallen with most crushing effect; in centres such as Galashiels and the like, some of the mills are almost at a standstill.

Whatever else may suffer, either directly or indirectly, through the greatly increased demand for this particular type of fabric, that demand must be met, and accordingly the worsted, in every fashionable shade of color, and sometimes in distinctly novel patterns, is here. If we may place belief in the opinions expressed by those

who presume to know, here it is likely to remain.

There would also appear to be some justification for this state of affairs. The smoother and neater threads employed in the manufacture of a worsted texture retain to the full their characteristics when that texture is woven and finished, and consequently the leading claim which is advanced on its behalf relates to the general neatness and style it possesses when made up into garments. This claim may, perhaps, be more conscientiously admitted than the one which usually accompanies it which relates to the qualities of the texture as regards wear. Owing to the peculiar smoothness of the yarns, which characterizes it among other fabrics, there is an increased liability for it to gloss or become shiny after being worn some little time. Herein seems to lie the only attribute to which exception is taken, but so long as the principle of manufacturing a worsted thread remains unaltered, this liability to wear lustrous must perforce do likewise.

In dealing with woolen fabrics an attempt has been made to show the great extent to which various colored or mixture yarns were used in this special branch, the weave as a rule, being more or less of secondary consideration. In fine worsteds, however, especially when they are designed for goods of a coating class, smart and ingenious crossings are to be desired.

On account of such fabrics being most frequently solid in color, usually piece dyed, and also being cropped of all loose projecting fibre in the finishing process, the interlacing of the threads becomes very apparent and the more ingenious the weave is, within certain limits, the smarter the effect will be.

In many cases, as for example a large proportion of serges, nothing but the simplest twills are employed. These weaves are always at hand making, as far as structural soundness is concerned, the most desirable of fabrics, but it will be advantageous to study one or two instructive examples of rather more elaborate construction.

Importance of Using Good Oil.

H. G. McKERROW.

There is a wide difference in the practice of American and European mills as to the use of oil in the processes of spinning and carding wool stock. The advantage does not seem to be wholly on the side of the American mills. The oils, as used, may be divided into three classes, lard oils, olive oils, and compounded oils. The most commonly used in this country are the lard oils, of which there are five or six qualities. In Europe it has been found more economical to use olive oils, and the average European manufacturer is firmly convinced that the advantages he obtains in his subsequent scouring processes easily offset any disadvantage in the initial cost.

Compounded oils, generally composed of bleached mineral oils and degras, have met with some favor in certain quarters, but there are reasonable and even formidable objections to the use of these compounds, of which the really scientific manufacturer is well aware.

In making compounded oils it is necessary, in addition to the sunbleached mineral oil which forms the basis of the compound, to add something which will give a body to act as a lubricant for wool, and for this purpose some fatty acid is employed. Lard is too expensive for this purpose, and so, in the majority of cases, a certain proportion of degras is employed. There are then two matters in the stock both of which are exceedingly difficult to get out, except by an excessive amount of scouring with alkali and animal fat. The degras is difficult to expel, and the mineral oil may almost be regarded as a fixture, so that even under the most favorable circumstances and with the most careful handling the manufacturer finds grease in his finished cloth.

The use of cotton-seed oil is practically prohibited owing to the danger from fire, and yet this is equally as great from mineral oil in the presence of moisture. Yet there can be no doubt a great deal of it is used, and it is only necessary to look at the great variation in prices of oils (from 28 cents to 55 cents) to realize that the margin cannot be accounted for solely by the difference in grade. There are without doubt many oils on the market sold as straight lard oils which are nothing more than compounds of lard and cotton-seed oil.

In the use of lard oils there are difficulties to be encountered. In the anxiety of the manufacturer to keep his cost down, the common market lard oils are usually made from the refuse of animals, which in the process of manufacture necessitates an excessive amount of acid for clarifying purposes. This again calls for a large amount of alkali to neutralize the free acid, leaving eventually a disproportionate amount of fatty acid in a more or less insoluble condition.

The consequence is that the average lard oil is almost as difficult to scour out of the cloth as the mineral oils, and there is nearly always more or less grease left in the stock. This may not be noticeable to any great extent until it comes to piece dyeing, but there the puzzled dyer is apt to find something in his cloth which appears to act as a resist to the color, and despite his best efforts he will be face to face with conditions which defy his getting an even color on the piece. This is a trouble which is met with daily in mills all over the country, and in many cases the various experts in the mills are at an utter loss to know the trouble. They do not realize that, because of the management's desire to use cheap oils, they have simply got a precipitate of grease in the cloth which makes perfect dyeing impossible.

It is the old trouble, "the shortest cut is generally the longest way round." The cheapest material, whether we talk of oils, dye-stuffs, or machinery, is not infrequently the most expensive investment that could be made, and while a few cents may be saved in one department, dollars must be thrown away in another. In Europe the practice is entirely different. Generally speaking, the oil used is an olive oil of good quality, and the European manufacturer firmly believes that by being liberal in this respect his resultant advantages show the very greatest economy.

For instance, in Europe goods are usually fulled and scoured without soap, except where they are scoured first preparatory to fulling. The reason for this is that oil is already in the goods, and the alkali and oil combine as a lubricant and form their own soap. In the latter case, where the goods are scoured first, the soap is required as a lubricant for fulling. To tell the average manufacturer on this side of the water that he could do all his fulling and scouring without soap, and be absolutely sure of getting goods which were entirely free from grease by buying a better grade oil than he has been in the habit of using, might excite his risibility, but it is a fact. His European brother manufacturer has found this out and realizes in his struggle to reduce the ultimate cost, that it is a penny-wise and pound-foolish policy to use cheap oils.

In the European mills, where a good quality of olive oil is used, the practice of recovery of oil has been brought to a reasonably fine point, and there are not many plants where a satisfactory grade of recovered oil may not be obtained. In the comparatively few places on this side of the water where olive oil is used, but little attention has been paid to this most important consideration. Where lard oil is used the principle of recovery is even less satisfactory.

From a cheap grade of olive oil, or from lard or compound oils, it is almost hopeless to expect valuable results in the way of recovery. A very common practice has been to allow the wool-scouring residue to run into

the recovery tank, which is looked upon as a kind of "catch-all" for everything of a greasy nature which may come out of the mill. The result is a black, stiff product, which is practically useless for any purpose. Its base is the residue of the cheapest grade of oils, and it contains besides all the soap from scouring. This is generally composed of tallow, palm oil, or cotton-seed oil. In other words, its ingredients may be animal fat, stearine, or palmatine, and in any subsequent use to which it may be put a still greater proportion of scouring and soaping would be necessary, thus making an endless chain of harmful methods.

If American manufacturers would get into the habit of using a good grade of olive oil in their processes of manufacture, they would find that they were, in the long run, employing the cheapest and most economical method. They would save much vexation of spirit to which they are now subject, their scouring account would be appreciably smaller, and the result in the dye-house would be more satisfactory.

Horse Blankets.

A detailed description of the manufacture of certain grades of these goods offers many interesting features which it may not be out of place to consider. There is quite an extensive trade in the cheaper grades of horse blankets, and the call is for a cheap but decidedly strong article, and the wide departure which we note in the making of these blankets certainly merits a description. To start with let us mention here that on these goods as well as on most others the selection of the stock is the most important item in its manufacture, for the labor cost of producing them is comparatively slight. What wool is used in these goods should above everything else possess the felting quality in a marked degree, and if this is mixed with some longer stapled and coarser wool a cheap mix may be obtained, which, with the trifling labor cost, will leave the maker quite a handsome margin of profit.

After the proper stock has been selected it is taken to the picker room where the first radical departure from the usual way of handling wool is noted. The stock is first run through a mixing picker, and after that through a bur picker and through both of them without the usual allowance of emulsion oil. This is entirely omitted; in fact, oil is rigidly excluded from the stock from beginning to end. When the stock has been properly picked it is sheathed up for removal to the card room. It is here fed to the cards in a promiscuous way, no attempt being made at weighing, and evenness of feed is of no importance; the stock is crowded through as fast as the card can take care of it. In fact such things as self feeds are rarely used where these goods are made. Instead of twisting the carded stock into roping, and winding it on side spools, as would be done were the stock to be spun, it is doffed on a revolving drum, and when a quantity has accumulated on this drum it is taken off in the shape of a sheet and folded and laid one side ready for the next step. It will be seen by this that it is unnecessary to feed evenly as if the stock were to be spun.

The sheets are then taken to the second breaker and there go through the same process. In some places the use of the second breaker is dispensed with entirely, one carding before the finishing being deemed sufficient. After that the sheets are ready for the finishing cards, which, in this instance, are termed "former" cards. These "former" cards are also provided with a drum, but this drum operates an endless apron which is usually forty yards long. This is the length the pieces are generally made. The apron runs in a stand provided with rolls, and to economize room runs as high as the room will allow, and at the other end of the stand is another drum over which the apron also passes.

Before feeding the stock into the

former, it is carefully weighed and the amount which is needed for the forty yards is then fed into the card as evenly as possible. The doffer comb deposits the stock upon the apron, which is set in motion as soon as the card is started, for the drum is belted to the card, and carries the stock along, putting one layer on top of the other till all the stock is run through. This web is then taken and rolled on sticks, which are called "bat" sticks, and when completed is taken off and laid one side and the card is fed again for another piece.

This completes the whole carding process, and the stock is now taken to what is called the punching room. A very simple machine is found here, the "puncher," which consists of a bed about 8 inches wide and as long as the width of the machine. About ½ inch above this bed we find quarter-inch iron rods about an inch apart from each other. On each side of this are found feed and take-up rolls, so that the goods may be run across the bed at an even speed. Over this bed is a board which is set into a frame on each side and securely bolted. These frames are connected, and by a simple mechanism are made to work up and down when the machine is in operation, thus bringing the board nearly down to the rods with each stroke. Into this board are set needles in such a manner as to pass them between the rods when the board makes the downward motion. There are about twenty-five of these needles to the square inch, and while the point is sharp there is a barb projecting from the needle just above the point in such a way as to take along anything in its way at the downward motion of the board, but at the upward motion everything is smooth and the stock thus carried down by the needle is left and the needle is ready for another descent. The rods must be kept very tight or else they will get out of place, and the needles will strike them and make them unfit for further use,—that is, the needles.

Now we come to the making of the blanket, the foundation for which is found to be a good grade of burlap. The burlap is run into the machine and the stick containing the stock is placed in a stand and the web is carefully laid on the burlap, and with it drawn over the rods. The machine is now set in motion and the board with the needles descending will force the stock through the burlap, returning smooth and ready for another onslaught, which is kept up until the stock has all been punched through the burlap. The piece is then taken and again passed through the machine, the other side up this time and another web of stock is provided and again punched through, so that after this operation is completed the burlap has received a good coating of wool, or its substitute, as the case may be, on each side, and you would not know it ever was burlap, for its appearance belies its character.

After the punching process has thus been completed the piece is ready for the next operation, which is the fulling. It will be easily seen that weaving is not in it with this machine, for it will punch many more yards in a day than the best loom can weave. The crank mill, such as is used on hosiery, is best adapted for the fulling of this class of goods, as the rotary mill would be apt to cause too much waste of the wool which it is quite an item to save. As there is no oil on the stock one would think that there would not be much need for alkali, but as these goods depend upon the felting for their lasting qualities, it is necessary that quite a good proportion of alkali be used. The better the stock is felted together the longer these blankets will last; in fact, we have seen them outwear blankets of many times their cost. For a stable blanket no better can be got, as they will stand a great amount of rough usage and still have sufficient warmth in them to meet the requirements of the stable. The soap should be of fairly good body and strength and it is quite a point of economy to use a soaping machine.

The length of time required for fulling depends entirely upon the stock, and varies from three quarters of an hour to one and a half hours.: The better they are felted the better the goods will look and feel. They should be overhauled and shaken out during the fulling process, at least once, and a little fresh soap added after entering them again into the fuller. They are then washed, which, owing to the absence of grease, is simply a rinsing process, but it should be thorough—using both warm and cold water in plenty.

After that they are colored and dried. On some of the better grades a light gigging just before drying is given, but as a general thing the brushing they get on the rotary press is sufficient to make them look all right. It is an object to save all the fibres possible, and therefore they are mostly colored, dried and pressed, after which they are resent to the making-up room where they are cut up and trimmed in the most approved horse clothing fashion. The finer grades which receive a gigging are brushed and sheared before pressing and are thus made to look very nice, but on the cheaper grades this extra handling does not pay.

REAUMUR.

Classing Wool.

In classing Australian wool for baling and shipping, there are several things that are taken into account, as color and condition.

The thin and mushy-back fleeces are thrown into a pile by themselves and kept separately from the good wool. For moderately sized clips, four grades of fleece are usually considered sufficient, three of these being hoggets, wethers and ewes, and a fourth of inferior fleeces that are tender, dingy or harsh.

Skirting is a matter left largely to the owner's discretion, the extent to which it should be done depending largely upon the kind of season passed through. Bellies are packed separately, and locks, if properly put up, are tolerably free from dirt. Tying with string is regarded as a great mistake, besides being unnecessary. On no account is crossbred wool mixed with merino.

—Arrangements have been completed between the James Hunter Machine Company of North Adams, Mass., and Wm. White of Nashua, N. H., whereby the Jas. Hunter Machine Co. will manufacture all of the machinery formerly manufactured by the Wm. White Textile Machine Co. Mr. White has allied himself with the Hunter Company, and will devote his entire time to selling their line of machinery consisting of soaping machines, fulling mills, cloth washers, also the Wm. White Textile machinery consisting of wool washers, dryers and carbonizing machines, dusters, etc., etc.

—The wool growers are a peculiar class of people, if the views of some of their leaders represent their true sentiments, and gauge their business judgment. Their forming a league in the principal wool markets to receive and sell wool, and advancing money on the same, and to hold it for sale at a price not less than a fair value, is an undertaking which will be found difficult to carry out. What constitutes a fair value has never yet been determined, and probably never will be. The time to sell is one of those questions that has agitated the minds of dealers for many generations. Combination of wool growers, or of manufacturers, for the purpose of attaining specific ends in the sale and purchase of commodities, invariably fails in the accomplishment of what is aimed at.

—Some dealers appear to think that a few days later than the terms stated will make no difference.

—Glycerine is a product of fermentation and it acts as a softener by extracting moisture from the atmosphere.

KNITTING DEPARTMENT.

The Knit Goods Situation.

The knit goods market is in much better condition than might be inferred from a hasty glance. The very unseasonable weather, so long protracted, has cost all concerning more or less dearly, but there is a steady drizzle of business, practically all of which pays some profit.

The temperatures of the first half of November have averaged about as high as last year, when it was next to impossible to interest buyers at any figures. This year they are willing to at least look at cheap stuff, beside nibbling a little. September and October trade, on the other hand, was not as good as last year, so that stocks are naturally smaller at this time. The rise in wool helped to busy up the market last fall.

Jobbers' stocks, with few exceptions, are almost too well cleared up, and the general business feeling is encouraging. So much for the whole line and especially of underwear.

Turning to hosiery it is more apparent every day that fancies are going to seed, even the best of them. There has been a persistent attempt to deny this tendency on the part of certain writers of market letters, who are now relapsing into a strange silence. More wool goods are being called for in proportion than the change of season will account for. Of the several reasons formulated therefor, none are illuminating. There is also a steady increase in the demand for split soles, which has been noted in a smaller way for months.

Chemnitz has not got beyond "talking" of an advance. Manufacturers there are not so fully employed as to be bragging. The desire for split soles goes into imported goods too, which are most active in lace and ribbed lines.

Full fashioned goods remain relatively strong, the firmness extending into fancies. Domestic seamless goods manufacturers are accomplishing wonders in the direction of color combinations and price. Their achievements ought to be an inspiration to other lines of the trade. If the manufacturers of fancies had realized what a different effect such designs have when worn on the leg, from their appearance when flat, more desirable results would have been obtained. The shrewd dealer will continue to keep a small choice line of fancies, making his selections largely on the basis just suggested.

Single orders were never smaller than now, but they follow in a steady string, for consumption cannot be staved off. Athletic goods promise to be in more request than ever next spring. Cotton hosiery has been experiencing the usual effects of a falling market. Of course, buyers have kept watch of the yarn market, and have demanded as concessions whatever advantage the knitters stood to gain in that direction.

In underwear departments cancellations have been few. Cooler weather in the South has ended the fever scare and given some impetus to orders from that section. The high temperatures have not been altogether responsible for the condition of business. There have been a not inconsiderable number of slow selling stocks on hand, but these are now largely out of the way. Underwear importers are making bold faces at the tariff, probably on the principle that "hope springs eternal in the human breast." Silk plush underwear is increasingly in evidence.

Some complaint has been made that jobbers' stocks are not kept up as comprehensively as they should be. The fact is, the jobbers have been learning lessons, as well as the retailers, in the hand to mouth plan. Middlemen cannot be expected to work at

a loss. As soon as dealers make it an object for jobbers to carry ample assortments, a widening of assortments may be expected, but not till then.

Practical Methods of Shaping Hosiery.

J. H. QUILTER.

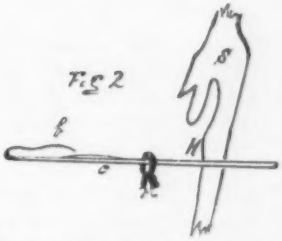
In connection with the manufacture of wrought hosiery, there is no more important item than that of shaping the garment, to enable which requires a system of both narrowing and widening of the fabric at any desirable time and at any position; and where necessary one or both of these processes should be in operation at the same time. On the bearded needle the loops have been removed from the earliest period of shaping by a small instrument known as the point. A few of these were first placed in a small wooden handle and manipulated by the hand of the workman.

In order to thoroughly understand the mechanical movements we may afterwards refer to, it will be better, first, to see what is required of these points. First as narrowing points to decrease the width of the fabric, and second, as a widening point to increase the width of same.

Fig. 1 shows the ordinary bearded or spring needle and a point. The needle A being in a horizontal position, as on the ordinary sack and sinker frames, previously described, B shows the point in its position, in connection with the needle. In order to see the work of the point, we must suppose that a new row of loops have been completed and are just knocked over. In the ordinary course, these loops would be taken back to the shank of the needle enclosed in the throat of the sinker, but where the narrowing is to take place, a distinctly different motion is given to the sinkers, which rise as they fall backward, so that the nose of the sinker leaves the finished loop on the shank of the needle beyond the needle beard as shown at Fig. 2. Ultimately the nose is clear of the needle, leaving the sinker free to swing with the part H acting upon the loop.

It will be necessary now to explain, that, in order to give the sinkers this different motion, and all the other motions, which both they and the points have, during the narrowing motions, the ordinary knitting cams go out of action and another set of cams act upon the narrowing machine levers, and all frame levers that require to have motion given to them during the motions to be explained. These various cams are on a second shaft, called the narrowing shaft, which only revolves at a narrowing

Fig 1.



course. This explanation will at once have conveyed to an ordinary reader the fact that while the narrowing shaft is in action, the ordinary cam shaft is out of action, and so the narrowing process occupies the time of a knitting course. This is perfectly true, and it is a point that is just now having the attention of some of our leading mechanics, who, no doubt, all intend on bringing about some means of avoiding this delay, and more so from the fact that another system of machine has been introduced by a well known American inventor using bearded or spring needles, where the narrowing processes are carried on simultaneous with those of knitting; but, of course, the construction of the machine is entirely different from the

jack and sinker principle we have under explanation in this article, and to which we will now return.

With the loop, as shown at Fig. 2, the point comes forward as at Fig. 1, and when in position over the beard "b" of the needle, it descends, enclosing this beard in a grove on its underside, as shown at G. The point now performs two duties. It acts as a presser to close the beard, while the end "c" of the point passes into the eye E of the needle, and so allows a free travel of the loop from the shank of the needle A, at O, on to the shank of the point B at O, the loop being brought forward by the sinkers H, which, after securely landing those loops where the points are over the needle on to those points, retire to the shank of the needle, while a racking motion is given to the points to take them one or two needles inward as required.

This completed, they then move forward, as at Fig 1, over the needles they are then opposite, and the sinkers then finish the motion of an ordinary course; that is, they descend, take the loops in their throats, and return to the shank of the needle, in which operation they have taken the loops from the points and taken them along with all others to their position on the needle shank. The narrowing machine, with its point moving out of the way and the ordinary cams coming into action, make an ordinary course as before described.

It is usual on ordinary rotary frames, for a second shaft, with the required cams, to act during the narrowing course only, being brought into action by special mechanism worked by a chain arrangement, so set as to narrow at any number of courses as desired, according to the article being made.

When the fabric is desired to be widened, then the points make a similar movement, but are racked outward and the loops transferred onto needles; usually one needle distance, and so leaving one empty needle. Now it is well known that when a needle is emptied of a loop, either for a purpose or accidentally, such needle, being void of a loop, does not knit at the first course next made, as the thread of that course simply laid over the needle forms practically an old loop, and it takes a second course to form a new one to be drawn through the previous loop and so commence knitting. The result of this is that a small hole occurs at the first course. Now this would not do under the present system of widening; so to avoid it, an extra point, called a widening point, working independent of the narrowing points, but with them, comes into action to lift up a thread from the last course previous to narrowing, and lays this on the empty needle. So an old loop is practically on the needle at once, though it is only usually a sinker loop of the course named stretched back onto the needle; but by this being there the empty needle knits at the first course, and so the hole, as a hole, is avoided; though the stretched loop, of necessity, makes the place a thin one as compared with those stitches, where narrowing takes place, as they are double stitches, and widening is only the practical splitting of a stitch.

It is this question of the narrowing or widening process, occupying the time of an ordinary course, that is, at the present time, proving a drawback to the bearded needle principle of rotary frame, for the making of the full-fashioned garments, especially so in the case of ribbed rotary frames; but of these we must treat later.

It is fast becoming a question in the minds of knitting experts as to the superiority of the usual system of knitting by forming a complete row of loops, and manipulating the same collectively, until all the processes are complete, over a new system of individual needle knitting, as is the case with latch needle machines. As in this latter case, each needle begins and finishes its loop, at once, and is then at liberty for any other operation, until such time as it is again required to knit. This space of time has been

taken advantage of on flat latch needle frames wherein to perform the narrowing process; and so we have latch needle machines making fashioned, plain and ribbed garments that narrow and widen during the time occupied by the ordinary knitting course.

Against this gain of time, the bearded needle machine claims the advantage of producing a better fabric. But we are now confronted with a new problem, and in all fairness we must state that this latest innovation is the work of a well known American inventor. This problem brings us to the fact that we have now a straight bar frame having bearded needles with independent action, each forming its loop and completing the same at once, and being at liberty for the narrowing or widening operation to be performed as on the latch needle principle during the completing of the course.

This system, now introduced, must be fairly tested before even an expert can give an opinion as to speed, a saving of time, or quality of work as compared to that produced under the old process. The writer, like many others, no doubt, will keenly watch the development of this new system.

To Improve the Standard of Goods.

Now that most mill products are subjected to extraordinary inspection for the purpose of finding imperfections which may have arisen from defective carding, spinning, bad knitting, seaming and improper finishing, it behooves every mill inspector to take particular pains to locate the defects before the goods pass out of the department which he or she represents. When the inspector discovers any imperfection it should be his duty to mark it, and try to find the operative who caused it, and show it to him, and if the same occurs again by the same operative, call the overseer's attention to it so the defect may be remedied without delay.

Now, here is the place where the problem of good discipline comes in. For just as soon as an operative discovers that a certain defect has passed inspection once, just so surely will he let others go, and imperfections will increase. So overseers should be on the lookout for all such defects, and stop their production at the beginning, for it is easier to do so then, than later on. I am sorry to say some overseers give this too little attention, prefering rather to hire some one, who claims he can do thus, and so, leaving this matter altogether too much in their hands, the consequence being poor results.

This is an important factor to the manufacturer, and overseers found guilty of such neglect (as I have known them to be frequently) a change should be made without delay. To overseers who are always busy and in a hurry, when the manager or superintendent is around, I would say, don't hurry, for hurry and wrong often go together, and they often result from idleness and carelessness.

Overseers should start with their help on the same course as they mean to follow, and let them know what they want, and if they will not do it, after a fair trial, find some one who will. Now don't understand me that one must always stop and explain orders, for that is foolishness, but in general lines let your subordinates be fairly familiar with your plans, as they will work better and you will be the gainer; for it is better to lead, than to drive.

In order to improve the standard of goods, the stock should be properly manipulated and opened before going to the cards, or otherwise lumps, and irregular places, will be produced, which is difficult to remove during any of the subsequent stages; and the source of such can only be traced with great difficulty. An effective opening of the stock should be followed by a good picking. Picking prepares the stock for the cards, but in too many cases the men in charge of the picking operation depend too much on the carding operation to overcome the defective work of the

picking. This is why there is so much poor yarn and goods in some mills. Carding machines will card out and arrange the fibre, but they will not do the work of the picker. For stock well opened and picked, carding ought to progress well, and the roping evenly formed on the cards. Even yarn can be made and spun, for the process of spinning consists simply in drawing out the roving about one-half and twisting it. If there is a cut or fine places in the roving, uneven yarn will be made, for much of the twist will go into the fine places leaving the larger part coarse and unspun. So the knitter in investigating the cause for uneven yarn should go to the carder and find out if all is right on the cards. If he is satisfied it is no fault of the spinners, for it often happens that spinners make bad work.

Some mills are employing the services of specialists, with a view of giving the help practical information and knowledge appertaining to their respective duties. I have been called to a number of late on scouring and washing fancy goods.

A. SCOTLAND.

The Quandaries of a Hosiery Manufacturer.

We published in our November issue a communication from a Western manufacturer of hosiery on woolen and worsted goods. He finds that he must obtain improved knitting machines or quit the business, and is thinking of getting three-quarter automatic knitters, and would like to arrange to run his machinery on cotton as well as on wool. He inquires if dyed cotton knits as well as white. He writes that one of his competitors is selling ribbed, 176-needle goods, averaging 2½ pounds to the dozen, for 90 cents—6 to 9½, made from two-ply yarn, with double knees. He wishes to be advised in regard to what kind of goods to manufacture, whether plain or ribbed, with number of gauge, etc., and what price is usually paid to operators for looping 160-needle work. We give below several answers to his wants from practical knitters.

Editor Textile World:

I notice in your November number, a communication from a Western hosiery manufacturer in reference to some matters that he desires to obtain information about. Dyed yarn does not work as well as white, and it costs more, by far, to manufacture goods this way. As to meeting competition that would depend on the facilities he has. It is my impression that the ribbed goods mentioned can be made for ninety cents, but when one has to advise, there are so many things to be considered he does not know just what to say. If the manufacturer knows his business he can keep his waste, needle and seconds account down, and get a good production off his machinery. As to three-fourths automatic machines, they are all right but there are preferences in make. As to gauges for rib machines, 30 gauge is the one most called for. It runs as follows:

Size 6	6²	7	7²	8	8²	9	9²
Ribs 66	66	72	72	78	78	84	84
Diameter 3¼ .	3¼	3½	3½	3¾	3¾	4	4

As to the line of goods to make I would try the one that I knew the most about. One is just as profitable as another. If it should be decided to try plain work, I should advise 160-needle gauge. As to price of 160-needle work, we pay five cents per dozen. It is necessary to either have a dyeing establishment or have one near so one can hire work done.

Editor Textile World.

In answer to your Western manufacturer, I would say that he can make it pay if he gets rightly started either on cotton or woolen. Of course when I say this, I mean that he must have the right machinery and tools. Now about the price per dozen. It is hard for a man that is in the mill all the time to be able to tell exactly the right price or market value. A man can make

half hose for $1.00 per dozen and have some profit. When your man asks if he will meet with competition, I can tell him he will meet with lots of it. There is no question about it, a man can make it pay him a good profit, if he goes about it in the right way. Get good American cotton, carded and spun rightly, with about ten turns per inch in the spinning, if he is going to run it in the gray. If he is going to have it dyed, he will have to put in 12 turns per inch. You see he will have to take it from the cop and put it into the skein, then the dyer will boil it for four and one-half hours, then turn in the tubs six or eight times according to the color he wants. He asks if colored will run as good as white. It will, if the dyer softens it enough. The best cotton to dye is combed cotton. It is clean and takes the dye better. No seed or short fiber. Good wool with four to five inch fiber will cost $1.00 per pound, and a man must get a good price and make very little waste to make it pay. I will say more in favor of cotton, as I am more familiar with it. Let him take 20 or 24 gauge and put on the 20 gauge No. 11 yarn, and on the 24, No. 16 yarn. Either number will make nice work on these gauges. I would advise plain work. I don't think that rib work wears as well or as long. It don't take so much material for plain work. You can stitch, board, press and finish cheaper. Yarn will cost fifteen cents per pound in the cop, one cent for spooling, five cents per dozen for knitting, five cents for stitching, one cent for mending, two cents for boarding, one cent for folding and boxing. Of course there are lots of other things to be considered besides what I have mentioned.

—Cashmere, for many centuries a Mahomedan country, with a climate favorable to the growth of wool, and a population ingenious in weaving, especially of shawls, was the home of a manufacture now altogether lost.

The American Automatic Hosiery Machine.

The American Knitting Machine Co. whose main office is 54 Wall St., New York, with branch in the Bannigan Bldg., Providence, now have on the market their complete line of full automatic seamless hosiery machines, which they build in great variety. Their plain seamless machine is adapted for hose and half hose, and is equipped, when desired, with a high splicing and sole re-enforcing device. It is also equipped with a plaiting and yarn changing device. This plaiting device is an important feature, as it enables hosiery to be made, on the back or wrong side of which is the cotton, and the face or right side of cashmere, thus giving the appearance of an all cashmere stocking, at a lower cost. The yarn in their machine is changed automatically in the heel and toe, but perhaps the machine which will interest manufacturers the most is their machine which knits a seamless foot and a ribbed leg, automatically ribbing down the front or instep of the stocking. The present type of machine built by the American Knitting Machine Co., is the result of careful development and many years' experience with previous machines. One important feature after another has been added, and efficiency and simplicity have been reached in a very high degree in their latest model, which is now offered to the trade.

Shrinkage in Weight in Hosiery.

Editor Textile World:

In regard to your subscriber's inquiry, in your November issue, as to the shrinkage in weight of finished goods, there is quite a difference of opinion between the views of dyers and manufacturers as to absorption. Dyers claim there is practically none, while some manufacturers claim that they have known cases where the yarn stored in a very damp room has gained 5 per cent.

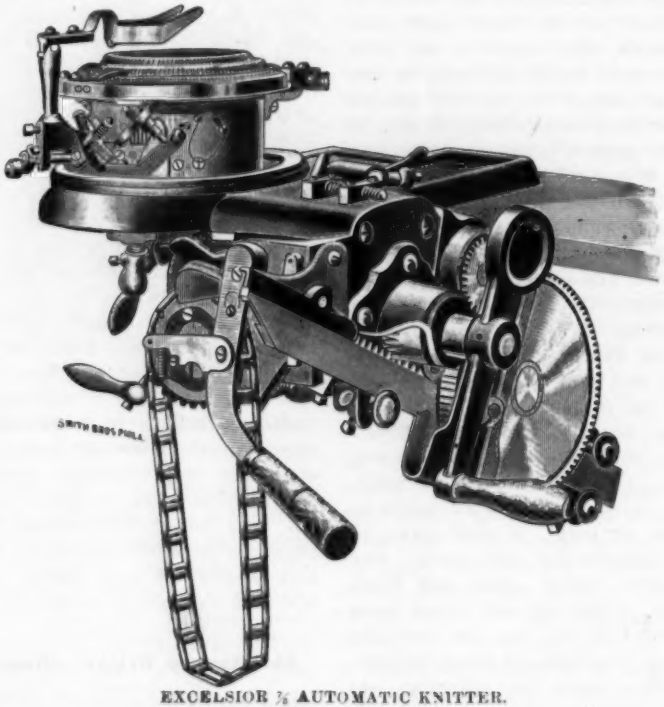
My opinion is that your subscriber

should look for the trouble in some other quarter. If the warehouse is practically dry, there should be no shrinkage whatever. If he takes all the clippings from the loopers, the welters and all the bad knitting, and weighs the finished goods after dyeing, he should lose nothing in weight, but should gain. Perhaps the knitters destroy or conceal some of the bad knitting. Perhaps, as in cases I have known, the goods are appropriated by the operatives.

GIBBONS FRAME.

The New Excelsior 7-8 Automatic Knitter.

In our last month's issue, in our industrial notes, we referred to the new 7-8 automatic knitter, made by the Excelsior Knitting Machine Manufacturing Company, which we now take pleasure in illustrating on this page. Improvements in this direction were induced by the favorable reception given by knitters to the 1897 3-4 automatic machine, which this concern places upon the market. This new



EXCELSIOR ⅞ AUTOMATIC KNITTER.

—The Textile Mercury, Manchester, Eng., gives currency to the statement that American silk is being sold in Lyons, the silk centre of France, and that French manufacturers are buying it in large quantities, especially silk of the grade used for lining purposes, to take the place of that formerly imported from Austria and Germany.

—Linen is more frequently dyed in the yarn state than in any other form.

7-8, or nearly full, automatic knitter, has features that should commend themselves to manufacturers, as possessing many points of value that the trade is constantly seeking, in order to meet the keen competition that is going on. This is an evidence of the enterprising spirit that actuates all of the business efforts of this concern, which is now established in its new works at Allentown, Penn. Its new building was erected exclusively for

its purpose, and contains every facility for the economical turning out of the various types of the Excelsior knitting machine, in the most perfect manner.

In further reference to the new 7-8 machine, we will say that when the cylinder is placed in the machine and the desired length of stocking made, it stops for the heel. The operator then splices in the extra thread, starts the machine on the reverse motion and after the heel is made, the machinery automatically cuts out the splicing thread, makes all the other necessary changes, and proceeds on the circular work until the toe is reached. By these improvements, it will be seen that the machine makes two stops less in the manufacture of the stocking, which it is claimed enables one operator to run four machines on half-hose instead of two. This is a point well worth considering.

Hosiery Quandary.

Editor Textile World:

I read with interest the letter from the Western manufacturer who was considering what he ought to do to keep up with competition, and also what you had to say in regard to it. Judging from my experience, colored cotton yarn does not usually knit as well as white, but it depends by what process it is dyed. If left soft, it makes little difference, but, as you say, dark shades are very hard to see, which makes imperfections more numerous and prevents rapid progress by the knitter. My advice would be, if that Western knitter is to meet such competition on cotton hosiery as he speaks of, that he had better not start in. Such goods cannot be made and sold for 90c. (2½ lb. ribbed). Yarn alone would cost about 40c. in the white. I know of no Western mill that is selling 2½ lb. goods for less than $1.25. I would suggest that a first-class plain black hose of about 200 needles, to sell at $2.00 or less if possible, would be a good thing to make, but it should be first-class in color, quality and finish.

ANOTHER WESTERNER.

Loss of Weight in Hosiery.

Editor Textile World:

Referring to the correspondence that appears in the November issue, would say that, in my opinion, cotton yarn will hold 2 to 2½ per cent. of moisture under ordinary conditions. If the storehouse is damp where the yarn is stored, it may shrink considerably in working in a dry, warm room. If the storeroom is warm and dry, or about the same temperature as where it is worked, it may even then lose a little in being opened to the air, if the outside weather is also dry. If the weather is wet, it might gain a little. I have sent scoured wool to Boston in wet weather, when it has gained three pounds on a sack in transit.

BERKSON.

—The Cotton's patent is the most wonderful of all systems of knitting, as it can be made to do almost anything, design, narrow, etc., and make anything from pants to glove fingers. The principle is that of the rotary on its back, only that the work is done mostly by motions given to the needle bar, by rocking shafts. Since it was invented in 1864, many new additions have been made to it. Among them are a rib machine, 1874. A top-machine by Jaquard, for making lace hosiery, 1896 (a previous patent to this was one in 1888, worked by a drum). This is one of the greatest uses of this frame. Lastly, the independent moving needle in 1896, for producing tuck and press-off work. This frame is used in almost all branches of the trade, and together with the other rotaries, has had the effects of supplanting hand labor, and of producing in a quicker and better way almost all kinds of hosiery, thus making it a great deal cheaper, if not better.

—When cultivating flax, care is required at every stage of its progress.

POWER DEPARTMENT

ELECTRICITY—STEAM—WATER.

Mechanical Draft for Steam Boilers.

By Walter B. Snow, of the Engineering Staff of B. F. Sturtevant Co. From a lecture delivered at Sibley College, Cornell University.

Undoubtedly the source of greatest loss in boiler and fuel efficiency lies in the usual high temperature of the escaping gases. In seventeen independent boiler tests, Donkin & Kennedy found the heat lost up the stack, when no economizer was used, to range between 9.4 per cent. and 31.8 per cent. of the total heat of combustion.

With the chimney, a comparatively high temperature of the rejected gases is an absolute necessity for the production of the draft. Its production by means of a fan is, on the other hand, independent of the temperature of the gases, and there is, therefore, opportunity to utilize the heat which is a positive and unavoidable loss in the case of a chimney.

In this direction lies one of the greatest opportunities for increasing boiler efficiency. Although additional surface may be obtained by reducing the size of the tubes and increasing their number, or by ribbing them, or introducing retarders, it is usually customary to abstract the surplus heat from the gases by some means in a sense independent of the boiler. It may then take the form of a feed-water heater, otherwise known as an economizer, or the form of a device for abstracting the heat from the gases and transferring it to the air supplied to the fuel, or both.

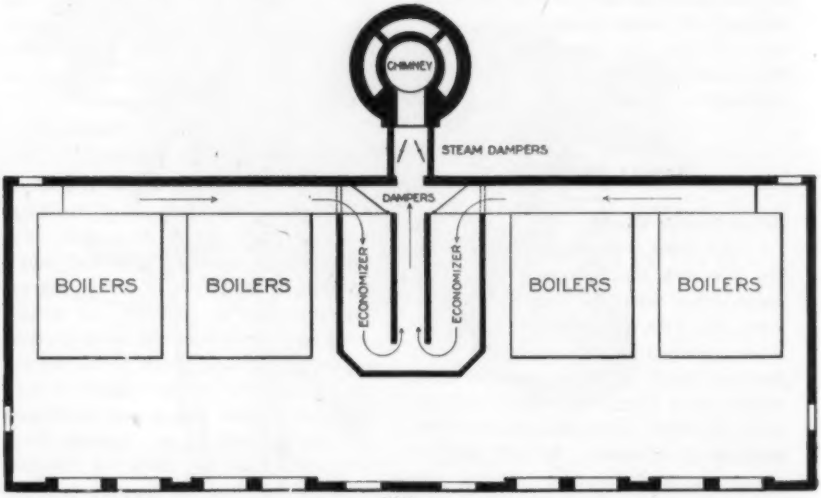


FIG. 1.

The results obtained by any of these methods have, in the case of chimney draft, always been restricted by the cost of the excessively high chimney necessary to produce the requisite draft with the decreased temperature and increased resistance. The simplicity and efficiency of mechanical draft, however, obviates this difficulty, and makes possible the attainment of a much lower final temperature of the flue gases with a corresponding in-

crease of efficiency. So far as production of draft is concerned, the gases may be cooled down to atmospheric temperature, but the practical limit is necessarily above this because of the expense of the abstracting apparatus required.

Numerous forms of heat abstractors have been devised for the purpose of transferring the heat from the escaping gases to the entering air.

Retarders in the tubes, as well as such devices as the Serve ribbed tubes, have shown a considerable economic gain, by a reduction of the stack temperature, and with both mechanical draft has been shown to be most desirable. It is interesting to consider

8 water-tube boilers of 200 horse-power each	$25,000.00
2 feed-water economizers	7,000.00
Boiler and economizers, setting and by-pass	6,000.00
Automatic damper regulator and dampers	300.00
Chimney, complete	9,000.00
Building, complete	11,000.00
	$58,300.00

In the plan Fig. 2 there are two fans, substituted for the chimney, each driven by a separate engine. Each fan is capable of independently producing the draft for the entire plant, and thus serves as a relay, if desired. Such an apparatus, with the short stack, can be installed complete, under ordinary conditions, for about $3500. The total economy in first cost effected by the introduction of the mechanical draft

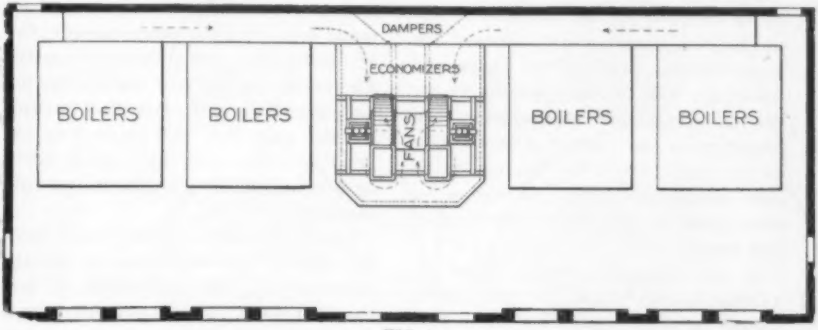


FIG. 2.

the influence, from a commercial standpoint, which the application of mechanical draft exerts upon the aggregate first cost of a steam-boiler plant. For this purpose there has been selected a plant of reasonable size of which the detailed cost is known. This plant consists of 8 modern water-tube boilers, each of 200 horse-power normal rating, set in pairs, making a total of 1600 horse-power. A chimney is provided, See Fig. 1, 8 feet in internal diameter and 180 feet high, of sufficient capacity to overcome the resistance of the two feed-water economizers and produce the draft necessary for any probable forcing of the boilers. The detailed cost of that portion of the plant which concerns the present discussion is, in round numbers, as follows:—

plant, which amounts to a reduction of about 62 per cent., may be indicated as follows; the saving of space occupied by the chimney being neglected:—

Chimney Draft.

Cost of chimney	$9000.00
Cost of damper regulator and dampers	300.00
	$9,300.00

Mechanical Draft.

Cost of fans, engines, draft regulator, and short stack, installed complete	$3,500.00
Saving by use of mechanical draft	5,800.00
	$9,300.00

A still further reduction might have been secured by designing the plant so as to operate the boilers at somewhat above their rated capacity, as could be readily done by means of the same mechanical draft apparatus. The omission of one boiler would bring

the rated capacity down to 1400 horsepower, and would call upon the fans to increase the steaming capacity of the other boilers by only about 14 per cent. above the normal. This would show an additional saving in first cost which may be thus presented:—

1,600 Nominal Horse-Power Plant.

Cost of 8 boilers	$25,000.00
Cost of settings, etc.	6,000 00
Cost of building	11,000 00
	$42,000.00

1,400 Nominal Horse-Power Plant.

Cost of 7 boilers	$21,875.00
Cost of settings, etc., about	5,500.00
Cost of building, about	10,500.00
Saving by use of mechanical draft	4,125.00
	$42,000.00

This shows a possible supplementary saving on the entire plant of $4125 which makes a total reduction of $9925 to be credited to the account of the mechanical method. Of course, the fixed charges for interest, taxes and insurance will be correspondingly reduced. Had this comparison been based upon the cost of a plenum or forced draft plant, the saving in the cost would have been shown to be even greater because of the smaller fan required.

In any properly arranged plant the exhaust steam from the fan engine would be utilized so that the actual cost of the steam used in producing draft would be reduced to practically nothing.

The value of the land may be an important factor in first cost. If figured at $2 per square foot, for instance, the omission of the chimney would in this case save $990 and the reduction in the number of boilers, $960 on the cost of the land required for the plant.

The total net saving in first cost of a single plant, under the given conditions, may be thus summarized:—

By omission of chimney and damper,	$5,800.00
By reduction in number of boilers	4,125.00
By saving in space occupied by chimney	990.00
By saving in space by boiler omitted,	960.00
	$11,875.00

This total saving is made possible by the expenditure of $3500 for the mechanical draft apparatus; that is, the saving is nearly three and one-half times the expenditure necessary to secure it. The reduction of $11,875 in the cost would indicate an annual saving in fixed charges of about $831 to $890, according as the aggregate of interest, taxes and insurance is taken at 7 or 7½ per cent.

This amount would, under conditions of the best economy, be practically sufficient to cover the cost of operating the mechanical draft apparatus, provided no attempt was made to utilize the exhaust steam, and would far more than cover it were this steam usefully employed. When to the economical advantages already pointed out is added the increased convenience of mechanical draft, its positive character, its ready adaptability, its independence of climatic conditions, and its instant response to any demand for increased steam supply, the account stands decidedly to its credit. Therefore, any further saving, as, for instance, in the cost of the fuel burned, is clear gain over and above any expenditure that may have been made on account of the introduction of this method.

Under ordinary conditions the steaming capacity of boilers may be greatly increased by the application of mechanical draft. This is equivalent to a reduction in the number of boilers required to secure the same capacity. Howden has shown that in the case of a certain vessel the cost of the boilers, fittings and connections, for the same output was $63,000 less with his system of forced draft than with natural draft. Such a reduction on shipboard is twofold in its effect, for it leaves so much more space unoccupied and thereby increases the carrying capacity of the vessel.

As a further factor in the matter of cost, it should be noted that the fan possesses a definite advantage over the chimney in that it is portable and is always a valuable asset. The chimney, on the other hand, is a fixture; it is suited only to certain conditions and is practically valueless unless those conditions exist.

The largest and most important factor in the operating expense is the cost

of the fuel itself, which should be measured, not by the number of pounds, but by the available heat units obtained for a given price. In this cost are properly included the transportation charges, the expense of getting the coal into the boiler house and putting it into the furnace as well as taking out and carrying away the ashes.

The ability to utilize cheap fuels is an inherent advantage of mechanical draft, due to the fact that such fuels, being, as a rule, finally divided, with a large percentage of dirt and ash, require an intense draft for their combustion.

—The prospects of the Crefeld velvet trade are steadily improving. Fancy velvets are much sought after, and orders for plain millinery velvets are increasing.

—From Shanghai sources the managers of the Yu Yuen Cotton Mill in the Markham Road have endeavored to enforce a reduction of 20 per cent. in the wages of their employees.

Setting Engine Valves.

THE RUSSELL ENGINE.

(Concluded from November.)

In the engine under consideration, the release and compression can be very readily and nicely adjusted by simply loosening the nut, clamping the arm, shown in cut, Fig. 9, to the valve stem, then by putting the wrench on the square end of the valve stem, shown in Fig. 10, the valve can be turned to any amount of compression,

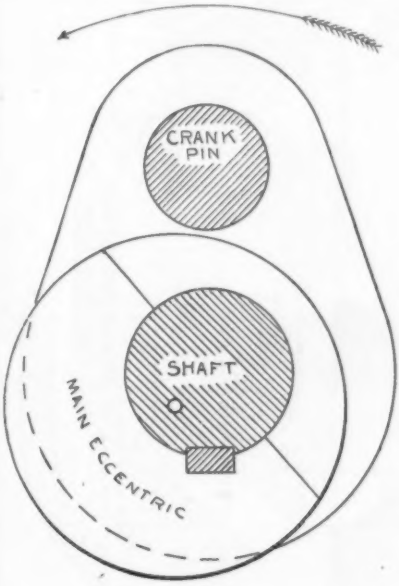


FIG. 12.

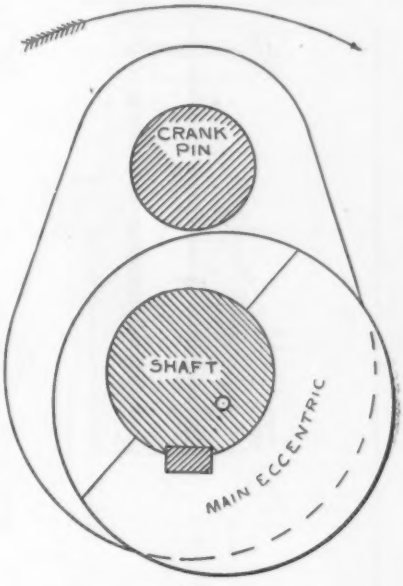


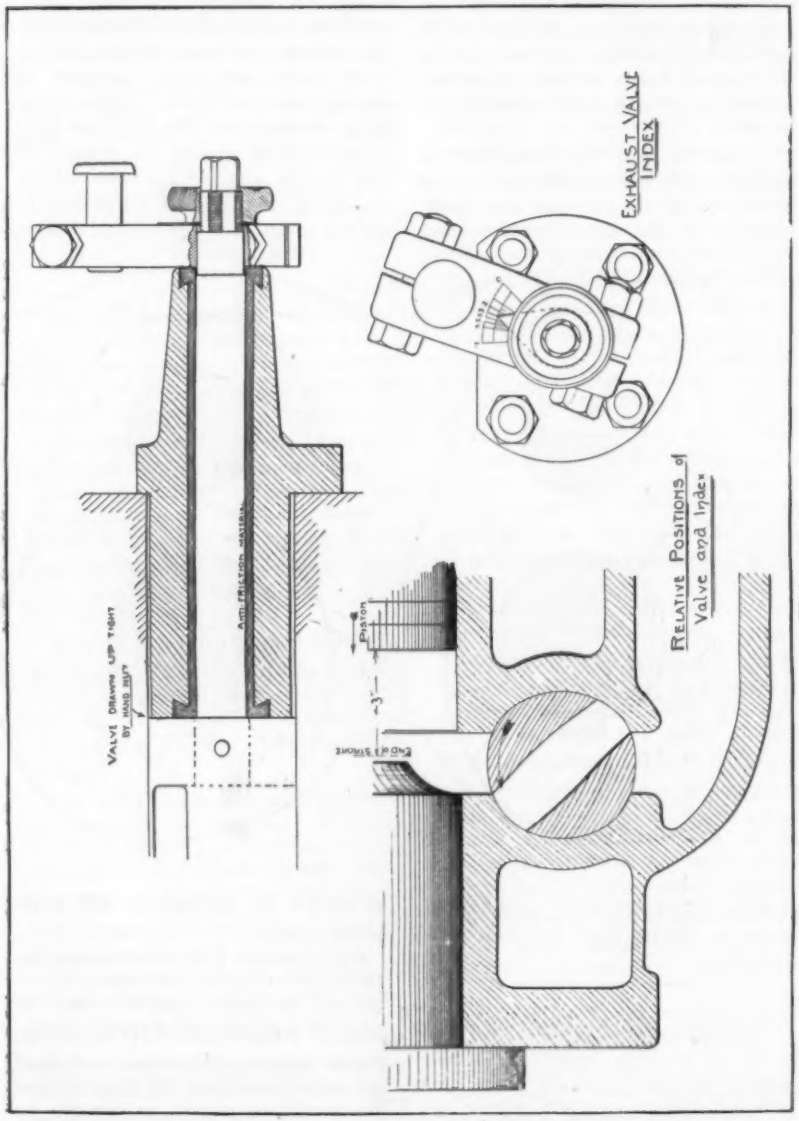
FIG. 13.

as shown by the pointer and graduated index.

Fig. 11 shows a section through the valve and cylinder, revealing a portion of the piston, and showing the point of compression at its beginning. Piston being within three inches of the end of its travel, the exhaust port has just been closed, as denoted by the direction of motion of exhaust valve, shown by arrow.

In setting the valves of this engine: Put in main valve; find its point of mid-travel by placing it alternately at points of opening to cylinder, marking face of seat lightly along the admis-

sion edge of valve at the other end, and then moving valve until the distances between these marks and the admission edges of valve are equal.



FIGS. 9, 10, 11.

Mark this position with a chisel. Leaving main valve at mid-travel, put in cut-off valve, and move it along until it shows equal port openings at each end with main valve. Mark this position with a chisel. Put on main and cut-off valve stems, and long and short exhaust connections, adjusting their lengths, so that the rocker arms will stand plumb when main and cut-off valves are at mid-position, and wrist plate is plumb.

To plumb wrist plate, mark distance between the centre of the exhaust valve stems and the small pins in wrist plate, to which the exhaust

valve arms are connected equally. Put on connecting rod.

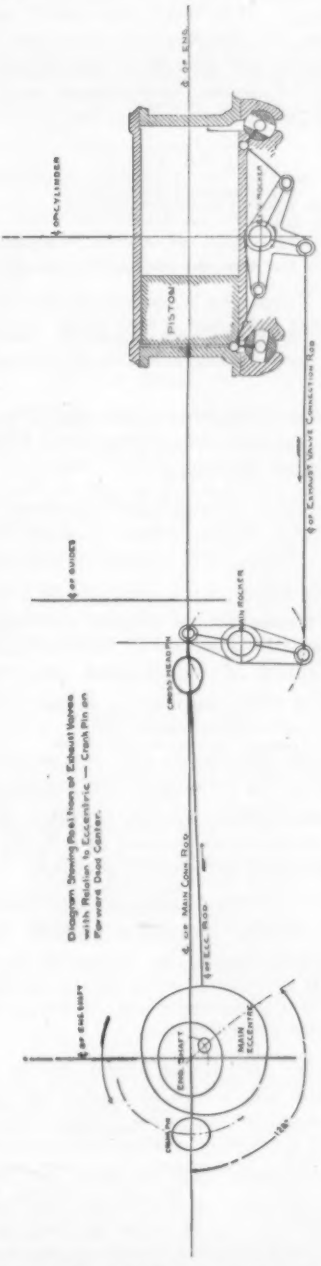

PISTON
Diagram Showing Position of Exhaust Valves with Relation to Eccentric — Crank Pin on Forward Dead Center.
MAIN ECCENTRIC

FIG. 14.

Next put on main eccentric, so its throw will lead that of the crank in the direction the engine is to run. The

shaft and eccentric being key-seated, the eccentric cannot be placed wrong

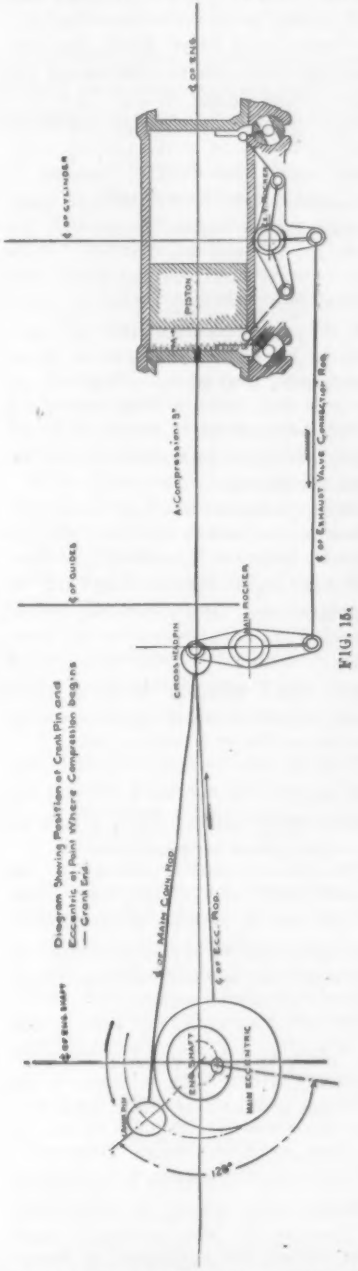

PISTON
A-Compression 3"
Diagram Showing Position of Crank Pin and Eccentric at Point Where Compression begins — Crank End.
MAIN ECCENTRIC

FIG. 15.

if this point is observed; namely, that the throw, or heavy side of the eccentric will lead that of the crank in the

direction the engine is run. The eccentric being in halves, it can be taken off and turned around, so that the face that is next to the cut-off eccentric will be next to the pillow block, and this operation reverses the motion of the engine, Figs. 12 and 13.

Put on main eccentric rod, and adjust its length by nuts at straps until main valve shows equal opening at the same end at which piston or crosshead is, with engine on centre. Attach cut-off eccentric and rod. Turn the eccentric by hand on shaft, and adjust length of rod as before, until cut-off valve travels equally on each side of its middle position, as found previously. Put governor together, so weights will follow or drag behind the trunnions in arms of governor wheel, to which they are attached when engine is running.

Block weights one-half way out. Turn engine over in the direction it is to run, until the crosshead has traveled one-eighth to one-sixth of its whole stroke. With governor wheel loose on the shaft, turn it in the direction engine is to run, until cut-off valve closes ports in the main valve from which the crosshead is traveling. Fasten governor wheel to shaft.

Now try the cut for both ends, adjusting the cut-off valve rod by the union nut or swivel, until it cuts off at equal points in the stroke.

The compression is shown by the index upon the exhaust valve arms, which may be verified or corrected if the index has become disarranged by markings on the back of ends of exhaust valves and chest.

The two diagrams, cuts, Figs. 14 and 15, show the different positions of the exhaust valves, with relation to the different positions of crank, and they also show the arrangement of motion of these exhaust valves, as transmitted through the double bell crank or exhauts valve rocker, to which they are connected. This motion is such, that during the admission of steam, when the highest pressure is on the exhaust valve, its speed is at its minimum, and at the moment of release, when the pressure is reduced to its lowest tension, its travel is at its maximum. This serves the double purpose of reducing the wear on the valves, and making a comparatively sharp corner on the indicator card at the point of release.

—In 1892 we witnessed a phenomenal year in business activity.

—High ideals as objects to be struggled for are essential to future greatness.

—India produces a limited number of good dyestuffs, but they are excellent.

—It is usually recommended to steep the flax the evening it is pulled to prevent it hardening.

—There is considerable divergence of opinion among doctors as to the danger limit of arsenic in articles of ordinary use.

—Fermentation reduces the sticky properties of size, and a given quantity of unfermented flour will carry more clay than a similar quantity of long fermented flour.

—In Cashmere the weavers are guided in their work by manuscript hieroglyphics written in lines in a book, which are intoned by a reader as the carpet (or shawl) proceeds.

—It is really questionable whether the modern designer of woolen and worsted fabrics for garments is as fully acquainted with the varieties of patterns obtainable in double plans as his predecessors.

—At the Royal Guest House at Jamu, the winter capital of the Maharajah of Cashmere, there were, a few years since, several very beautiful carpets. These were manufactured in Moultan for the Maharajah under the direction of an officer of the Court, and were of superior quality to anything made for ordinary trade either at that time or since.

DYEING DEPARTMENT.

Dye Recipes for December.

The following recipes appear in the Dyers' Supplement, which is issued each month by the TEXTILE WORLD. The Supplement contains the colored samples, dyed according to recipes given. The selection of samples is carefully made, and it is the aim to show shades which are of especial interest to the dyer, and which the requirements of the market demand. The Dyers' Supplement is a 16 page pamphlet, in convenient form for preservation. Subscription price for the TEXTILE WORLD with the Dyers' Supplement is $3.

RECIPE NO. 177.

Yellow on Cotton Yarn.

Columbia Yellow on 100 pounds cotton yarn.

Prepare dye bath with

2½ lbs. Columbia Yellow.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
20 lbs. Common Salt.
½ lb. Sal. Soda.

Enter in yarn at boil, and turn one hour at that heat.

Columbia Yellow comes in the shape of a dark yellow powder, very soluble in hot water, dyes slowly and level on the fibre, and will combine with direct colors for shading. (This dye was used in the 1897 Dyers' Supplement, recipes 85 and 86, for light yellow and orange yellow, respectively.)

RECIPE NO. 178.

Blue on Worsted Yarn.

Alizarine Lanacyl Blue R on 100 lbs. worsted yarn.

Prepare dye bath with

2½ lbs. Alizarine Lanacyl Blue R.
(Wm. Matheson & Co., Ltd., 182 Front St., New York.)
10 lbs. Glauber's Salt.
5 lbs. Acetic Acid.

Enter in yarn at 140 deg.; bring to boil while turning, and turn one hour at that heat. Then add another

5 lbs. Acetic Acid

to the bath; enter and turn 20 minutes longer, at boil. Rinse.

The Alizarine Lanacyl colors are very well known brands of dyestuff, and are noted for their fastness and easy method of dyeing. (See the following recipes for colors from Alizarine Lanacyl dyes: 51, 56, 91, 110, 126, 141, and 159 in this year's Dyers' Supplement, also 185, this issue.)

RECIPE NO. 179.

Black on Cotton Yarn.

Black on 100 lbs. cotton yarn.

Prepare dye bath with

6 lbs. Pluto Black G.
(Farbenfabriken of Elberfeld Co. 40 Stone St., New York.)
25 lbs. Glauber's Salt.
5 lbs. Soda.

Enter in yarn at boil, and turn one hour at that heat.

Pluto Black G produces a full jet shade of black, and as it will combine with other benzo and direct dyes, it can be used to advantage for combinations, as well as dyeing a fine shade of black of itself. (See recipe 46 for a slate, and Recipe 99 for a black from Pluto Black B).

RECIPE NO. 180.

Red on Cotton Yarn.

Bordeaux C O V on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Bordeaux C O V.
(New York & Boston Dyewood Co., 55 Beekman St., New York.)
20 lbs. Glauber's Salt.
1 lb. Sal. Soda.

Enter yarn at boil, and turn one hour at that heat.

Bordeaux C O V produces, by itself, a fine fuchine shade, and when combined with other substantive colors, very fine combination shades can be dyed in one dip.

RECIPE NO. 181.

Blue on Flannel.
(Wool and Cotton).

Alizarine Blue D G on 100 lbs. cotton and wool flannel.

Prepare dye bath with

2½ lbs. Alizarine Blue (Powder) D G Patented.
(Victor Koechl & Co., 122 Hudson St., New York.)
50 lbs. Common Salt.

Enter in cloth at boil, and turn 1½ hours at that heat; shut off steam; and run ½ hour longer. Rinse.

Alizarine Blue D G dyes a fine, greenish shade of blue on mixed goods, producing a fast color. It covers up the wool and cotton equally, and does not rub off or crock. It will also dye all cotton goods with the addition of Ammonium Chloride to the dye bath. (See, for colors from other brands of Alizarine Blue, Recipes 13, 43, 57 and 68.)

RECIPE NO. 182.

Brown on Cotton Yarn.

Rhine Brown B on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Rhine Brown B.
(O. S. Janney & Co., 8-10 Letitia St., Philadelphia.)
2 lbs. Soda.
20 lbs. Common Salt.

Enter in yarn at boil, and turn one hour at that heat.

Rhine Brown B is more of a blue shade than the G G brand, shown in recipe 163, November issue. It dyes, as per the sample here given, a full, deep, dark brown. Rhine Browns will combine with other direct colors, and as they are very concentrated, the dyer will find them a substitute for cutch, as by an after treatment with blue vitriol and chrome very fast shades can be produced. Rhine Browns are new brands of colors, and according to results obtained from them, they are very valuable. (See Recipes 115, 116, 130, 135 and 163, for shades of brown from different brands of Rhine Brown.)

RECIPE NO. 183.

Reddish Brown on Cotton Yarn.

Diazyl Brown 3 R on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Diazyl Brown 3 R.
(C. Bischoff & Co., 87 Park Place, New York.)
2 lbs. Soda.
20 lbs. Salt.

Enter in yarn at boil, and turn one hour at that heat.

Diazyl Brown 3 R being of a reddish cast, will be found very useful in combining with other Diazyl colors for shading. This color dyes wool, silk and cotton mixed goods in one dip. (See Recipes 118 and 121 showing the use of Diazyl Brown G; also, see Recipe 190, this issue.)

RECIPE NO. 184.

Black on Cotton Yarn.

Direct Black G on 100 lbs. cotton yarn.

Prepare dye bath with

5 lbs. Direct Black G.
(A. Klipstein & Co., 122 Pearl St., New York.)
20 lbs. Common Salt.
1 lb. Soda.

Enter yarn at boil, and turn one hour at that heat.

Direct Black G dyes a fine shade of jet black, and can be toned to a bluer shade by adding Direct Blue, sold by the same firm. (See Recipe 166 for a slate shade, from this dye.)

RECIPE NO. 185.

Blue on Worsted Yarn.

Alizarine Lanacyl Navy Blue 3 B on 100 lbs. worsted yarn.

Prepare dye bath with

2 lbs. Alizarine Lanacyl Navy Blue 3 B.
(Wm. J. Matheson & Co., Ltd., 182 Front St., New York.)
5 lbs. Acetic Acid
10 lbs. Glauber's Salt.

Enter in yarn at 140°; bring to boil while turning, turn one hour at that heat, then add another

5 lbs. Acetic Acid.

Turn 20 minutes longer; lift out.

Alizarine Lanacyl Navy Blue 3 B has all of the good qualities as the other Lanacyl colors, working and combining with them. (See Recipe 178, this issue.)

RECIPE NO. 186.

Tan Brown on Cotton Yarn.

Tan Brown on 100 lbs. cotton yarn.

Prepare dye bath with

1 lb. 10⅔ oz. Thiocatechine No. 1.
13⅓ oz. Thiocatechine No. 2.
(Sykes & Street, 85 Water St., New York.)
8 lbs. Common Salt.
8 lbs. Carbonate of Soda.

Enter in yarn at 160°, bring temperature up to 200°, and turn at that heat one hour. Rinse off well and develop the shade in a separate bath to which has been added

4 lbs. Sulphate of Copper.
4 lbs. Sulphuric Acid.

Turn for ½ hour at 140°, and rinse well.

Thiocatechine will be found one of the best dyes to produce fast, fine, cutch shades. These colors are very fast to light and washing. These brands of Thiocatechine combine freely, and the shades of browns can be varied by a fixing bath of bichromate of potash and sulphuric acid, which produce somewhat different shades than sulphate of copper and sulphuric acid. These colors will be found useful by dyers in hosiery and gingham mills, as the color, after being developed, does not run or bleed when woven with white. The dyer will be able to get any shade of brown wanted, from a light tan shade to a seal brown. Thiocatechine also combines with Vidal Black and Cachou de Laval. (See Recipes 11 and 13.)

RECIPE NO. 187.

Green on Cotton Yarn.

Benzo Green G on 100 pounds cotton yarn.

Prepare dye bath with

2 lbs. Benzo Green G.
(Farbenfabriken of Elberfeld Co., 40 Stone St., New York.)
20 lbs. Glauber's Salt.

Enter yarn at boil, and turn one hour at that heat.

Benzo Green G, while dyeing a full shade of green, by itself, can be combined with other benzo dyes for shading. (See Recipes 125, 143 and 153, for shades of green from Benzo Green B B.)

RECIPE NO. 188.

Crimson on Cotton Flannel.

Diphenyl Violet on ten pieces cotton flannel (100 lbs.).

Prepare dye bath with

2 lbs. Diphenyl Violet R.
(John J. Keller & Co., 104 Murray St., New York.)
25 lbs. Common Salt.
1 lb. Sal. Soda.

Enter yarn at boil, and turn one hour at that heat.

Diphenyl Violet R being a direct color, dyes a full and bloomy shade, and as less color is used in the second bath, the cost of dyeing is comparatively low. (See Recipe 173 for a pink.)

RECIPE NO. 189.

Orange on Cotton Yarn.

Direct Orange G Y on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Direct Orange G Y.
(John J. Keller & Co., 104 Murray St., New York).
25 lbs. Common Salt.

Enter yarn at boil, and turn one hour at that heat.

Direct Orange G Y dyes a very level shade of color on the fibre. It does not rub or crock, and will combine with other direct dyes for shading. (See Recipe 169 in November Dyers' Supplement.)

RECIPE NO. 190.

Reddish Purple on Cotton Yarn.

Diazyl Brown V on 100 lbs. cotton yarn.

Prepare dye bath with

3 lbs. Diazyl Brown V.
(C. Bischoff & Co., 87 Park Place, New York.)
2 lbs. Soda.
20 lbs. Salt.

Enter in yarn at boil, and turn one hour at that heat.

Diazyl Brown V is also well adapted for dyeing mixed wool and cotton, in one bath, dyeing a perfectly even color on the fibre. (See Recipe 183, this issue.)

RECIPE NO. 191.

Bright Red on Worsted Yarn.

New Fast Red on 100 lbs. worsted yarn.

Prepare dye bath with

2½ lbs. New Fast Red.
(Hanna-Schoellkopf Co., 135 No. Water St., Philadelphia
4 lbs. Sulphuric Acid.
10 lbs. Glauber's Salt.

Enter yarn at 120°; bring to boil while turning, and turn to shade at that heat.

New Fast Red, as per the sample here shown, is a brilliant color, dyeing a full shade with 2½ per cent. The dyer will find it to work satisfactorily, on piece goods, yarn or raw stock, producing fast shades.

RECIPE NO. 192.

Blue on Worsted Yarn.

Mazarine Blue on 100 lbs. wool yarn.

Mordant for two hours at boil, with

3 lbs. Bichromate of Potash.
2 lbs. Lactic Acid.

Rinse off and dye in a separate bath with

10 lbs. Mazarine Blue R N S.
(Anchor Color Mfg. Co., 462 Cherry St., New York.)
2 lbs. Acetic Acid.

Enter yarn at 180°; bring to boil while turning, and turn to shade at that heat.

Mazarine Blue dyes fine shades of indigo blue. It works slowly and evenly on the fibre. (See Recipe 154.)

New Dyes.

Some of the recipes used this month in our Dyers' Supplement are those that have heretofore appeared, but in new combinations, producing new shades, yet possessing as much interest as when first introduced. We call attention, however, to the two colors that have not heretofore appeared as noted below.

In Recipe 180, the New York & Boston Dyewood Co., New York, show one of their most attractive colors, produced from Bordeaux C O V, for a red on cotton. This is, however, one of the regular substantive colors of this house, of a very blue shade. Its particular advantage is in being especially bright. We think it will prove particularly interesting to dyers.

Recipe 191 shows a bright shade on worsted yarn, obtained from New Fast Red, sold by the Hanna-Schoellkopf Co., Philadelphia. This is an American brand of a well known color, and as an American product, the house from which it is obtained, claims it to be as pure in shade and as economical in use as anything that can be secured. Its fastness to light and washing is good. It does not rub off, and can be applied to knitting and carpet yarns, and can also be used on felt hats.

The Printing of Tapestry Carpet Yarns.

In our November issue we referred to an article by David Paterson, on the above subject, that appeared in one of our London exchanges. We then stated that the methods of printing the various colors on tapestry carpet yarns was invented by Richard Whytock of Edinburg, in the year 1832. Like the majority of clever inventions, Whytock"s method of coloring tapestry carpets is very simple in theory, yet in actual practice, the many little important details requiring attention give it a complexity which renders it difficult to comprehend at first sight.

In order that a clearer conception may be had of the methods pursued in the manufacture of tapestry carpets, we give the accompanying illustrations and descriptions:

The design of the carpet pattern is first painted on paper divided into little squares or parallelograms, each little oblong representing a loop in the finished carpet (see Fig. I.) This colored design, which somewhat resembles a mosaic, is pasted on a board and hung beside the printer. The yarn is colored on a large wooden cylinder or drum, which is covered with

varnished or glazed cloth to prevent the dyes from entering and staining the wood. The drum is wound evenly round with one layer of the carpet yarn, giving it the appearance of an immense bobbin, covered with one layer of thread. The drum is covered only half-way across with yarn thus making only half the number of carpets. Underneath the drum and running in the direction of its axis is a small set of rails, on which runs the carriage for the color boxes for supplying the various colors to the yarn.

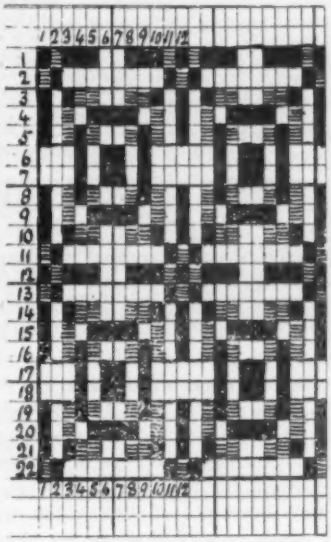


FIG. 1

In each box, and partly submerged in the color paste, is a roller or pulley, varying in width from ¼ to ½ inch, which, as the color box runs underneath the drum, presses up against the yarn by means of springs adjusted to the carriage, and thus rules a streak of the color right across the yarn on the drum. Down the length of the design is a numbered scale (see Fig. 1) each number corresponding to the oblongs or stitches on the ruled paper; while a similar scale is fixed round the rim of the drum, these printing drums varying greatly in circumference according to the requirements of the patterns to be printed.

To show how the printing operation proceeds we may take a very simple example as seen in Fig. I., which represents a checkered design in red, blue and white; the black oblongs representing red, the striped ones blue, and the white ones white. The drum, which is ready covered with yarn is turned round on its axis till 1 on its index is reached, when the first drum is ready to be printed. The first color which comes in the design is red, i. e., a black square, so a color box containing the requisite red color is placed upon the carriage and made to run under the drum. In doing so the pulley which it contains presses up against the yarn on the drum and leaves a red stripe as it traverses across it. The next color to print—proceeding down the design and not across it—is a blue, i. e., a striped square. The drum is now moved round one division to 2, so that the line of color already printed is just escaped and the blue color box substituted for the red one and run across the rails as before. This leaves a blue stripe side by side with the red one already printed.

It will be seen from the design Fig. I. that the next three spaces, always reading down the design, are all red, 3 to 5, so the red box is again put in and 3 stripes ruled, the drum being turned one number after each stripe. Numbers 6 and 7 are left blanks, as they have to remain white yarn, so the drum is turned round to 8 on index; here follow 3 stripes of red, then blue is run in at 11, red again at 12, blue again at 13. Then follow 3 stripes, 14 to 16, of red, 17 and 18 are left blanks, 19 to 21 are red, and the first drum finishes with a blue stripe at 22. When all these colored stripes are made, according to the design board, the drum is finished. The yarn is then carefully taken off, the number attached to it, i. e., drum 1, and it is then carried away to the steaming which fixes the dyes upon the yarn.

The drum is again covered over with yarn as before and drum 2 is begun. The first color here is blue, the blue box is run through making its stripe of blue, then follows one of red. From 3 to 10 are left blanks, so the drum is turned round to 11 on its index and a stripe of red made. Then follows blue at 12, red at 13, blanks from 14 to 21, and drum number 2 finishes with a stripe of red at 22.

Tne yarn is now taken off, number 2 attached to it and then steamed as before. Then follows drum 3. The first stripe here is red, 2 is a blank, 3 a red, 4 and 5 are blues, 6 and 7

FIG. 2.

blanks, 8 and 9 blue stripes, 10 a red, then blank, red, blank, red, then at 15 come 2 blues, 2 blanks, 19 and 20 blues, 21 red and 22 blank. This finishes drum 3 and so the printing process continues until all the drums are printed according to the design paper.

In actual practice the printer puts in all the parts requiring one color, before proceeding to use another color, and all the light, delicate tints like buffs, light sages, drabs, etc., are printed before the dark shades. Suppose then, for the sake of simplicity, that there were 100 threads of yarn wound round the drum, all these 100 threads would be colored exactly alike and each would make one single colored thread for 100 duplicate carpets. When all these parti-colored hanks of yarn are steamed, washed and dried, they are arranged in their proper order, according to their attached numbers, and each thread is adjusted in the setting frame to its right position. We then have the threads dyed at the regular prearranged intervals, corresponding exactly to the colored design which was copied; but instead of one copy we have 100 copies, or repeats of the same pattern in one long continuous web or warp.

The design, as it appears on the colored threads in the setting frame, has a very elongated appearance, as represented in Fig. 2, but this disappears in the weaving, as the threads are drawn up into loops and contracted, bringing out the pattern of the carpet exactly as it appears on the painted design paper.

It will be readily seen that Whytock's process of printing is a great saving in labor compared with the block-printing style. In block-printing a new block is required for every new pattern or design, but by Whytock's method, no blocks are required, and the printing pulley serves for all patterns as the one pencil serves for drawing all kinds of designs, or the one pen serves for any style of writing. If an object, say a little touch of pink in a flower, occurs in a tapestry pattern, the block printer, to give the requisite touch of pink to 100 carpets, would require to apply his block 100 times, but if the yarn be wound round the printing drum 100 times, it will be seen that one streak of the pink color across the drum would give to the flower the requisite touch of pink for 100 carpets. If the yarn be uncoiled from the drum it would be found dyed in 100 places equi-distant from each other, and at exactly the spot where it was wanted to tip the flower with pink from end to end of the 100 carpets.

Fig. 1 represents the design as painted for the guidance of the printer. Fig. 2 represents the elongated pattern of the printed yarn arranged in proper order by the setters, and ready for being wound upon the

beam and woven into carpet. Fig. 3 represents the woven carpet completed; the pattern no longer assumes the elongated appearance as seen in Fig. 2 because the yarn, in being drawn up by the wires in the weaving to form the looped surface, becomes contracted, and the design regains its correct proportions.

In a tapestry of good quality, having nine wires or loops of thread per inch, 5 inches of printed yarn become contracted into 2 inches of woven carpet, while in a poorer quality with

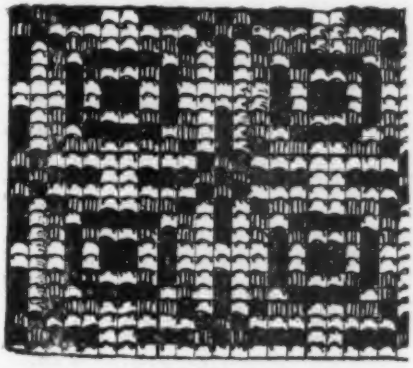


FIG. 3.

only six wires per inch, 3 inches of yarn form 2 inches carpet. In the poor qualities of tapestry the yarn is drawn out to cover as much surface as possible.

—The changes in the style of doing business to-day where the mills make a great variety of goods, and taking orders to-day to be filled in a very short time, demand that the harness maker shall be prepared to fill his orders with the least possible delay, and compels him to keep twice the amount of machinery on hand that he averages in use. The larger makers to-day are called upon to supply harness in from five to ten days, and must be prepared to knit from five hundred to one thousand shades a day that as little time as possible shall ensue between the knitting machine and finishing.

Waterproof Fabric.

Fabrics such as cloth, felt, and paper have been coated or saturated with pyroxylin solutions for the purpose of making them waterproof. Such solutions generally contain oils. The non-drying oils turn rancid in the course of time, which gives these fabrics a disagreeable odor and to a large extent affects the strength. The most prominent non-drying oil used for the purpose has been castor oil. These waterproof fabrics have been improved by the introduction of certain new elements into the combinations, by means of which a waterproof fabric is secured, in which the tendency of the oils to turn rancid is largely diminished. As a consequence such fabrics have a less disagreeable odor and are more durable. This is accomplished by combining waterproof solutions with compounds or salts containing what may be termed the "radical" C_6H_5O of phenol (C_6H_5OH.)

It has been found that phenol itself (carbolic acid) possesses many objectionable properties as an ingredient in waterproofing solutions, but that salts of compound acids containing the phenoylic radical C_6H_5O or compounds of the phenoylic radical with bases can be used with success. These compounds of the phenoylic radical with bases are sometimes called "salts of carbolic acid."

The sulfocarbolates and carbolates are the best to use. Success has been met in using sulfocarbolate of soda.

As an example of a waterproofing solution the following is recommended: pyroxylin, one hundred parts; castor oil, one hundred and fifty parts; camphor, one hundred and fifty parts; sulfocarbolate of soda, four parts, and wood-spirit sufficient to make a solution which can be spread. The nature of the peculiar decomposition to which these oils are subject and which results in rancidity has not been understood by chemists. It is not clearly known, for instance, that an antiseptic substance would operate to retard such decomposition. It has been dis-

covered, however, that this is a fact, and that the rancidity of castor oil, for instance, is probably due to the same causes which generally operate to decompose organic matter.

While the term "antiseptic" is a somewhat general one, nevertheless it is perfectly understood by chemists and others, and the antiseptic properties of substances are also well known. Consequently the operator is already sufficiently informed as to the antiseptic value of the different compounds containing the phenoylic radical, and it is therefore unnecessary to give any further description in order to enable him to practically use compound.

Sulfocarbolate of soda is particularly recommended; but there are other salts and compounds from which the operator may select. An antiseptic salt or compound which is soluble in the solvent employed is preferred—say in wood-spirit—although while this gives the best effects it is not absolutely necessary, because antiseptic salts or compounds can be thoroughly ground with the oil in a paint-mill or otherwise. The proportions also will vary according to the circumstances—such as the amount of oil, the expected conditions of rancidity, the strength of the antiseptic used, etc.; but in general the proportions will be, say, from two to five parts, by weight, of the antiseptic to each one hundred parts of pyroxylin.

Bleaching With Sodium Peroxide.

The bleaching of wool or mixed goods by the use of sodium peroxide is gaining more favor. The most approved method is substantially the same as follows:

For 100 to 150 lb. material :—
100 gal. cold water ;
8 lb. Sulphuric Acid S G, 1,840 ;
3 lb. phosphate of ammonia ; and
7½ lb. sodium peroxide.

When these quantities are carefully adhered to in practical working, satisfactory results are arrived at. The regulation of the degree of alkalinity of the bleach bath is an important factor in the success of the process, and owing to different qualities of water used or material to be treated, in some cases adjustment is required. Should the bath on being prepared according to the formula show too pronounced alkalinity, a little phosphoric acid should be used to tone this down; litmus paper can be employed as a handy means of settling this point. The alkalinity of the bleach bath should be only sufficient to gently turn red litmus paper blue, i.e., the bleach liquor should be just on the alkaline side. It sometimes happens that during the bleaching operation, perhaps after one hour's immersion, that the natural acidity in the wool may counteract this alkalinity and neutralize the bath. In this case a little liquid ammonia is added to restore the balance and ensure perfect success. When making up the bleach bath it is advisable, in fact almost essential, to let it stand some fifteen to twenty minutes so that the scum collecting on the surface can be skimmed off with a wooden scoop or other suitable article before the material is entered for treatment. To restore, add one-fourth the above quantities.

—The mercerizing process on cotton in its original form has, ever since its discovery, been used to a limited extent for the production of crepon effects on cotton cloth, these being produced either by the local application of the thickened alkaline solution by means of engraved rollers, or more usually in the following manner:—The cloth is printed in those portions which it is desired to protect with a thick solution of gum arabic or senegal, which acts as a resist towards the caustic soda solution. On treatment with the latter the fabric is therefore affected only in the unprotected portions, which shrink and cause the remainder of the cloth to pucker up. Many pleasing effects may be produced in this manner.

—The word "linen" comes from the botanical name of the plant "linum."

QUESTIONS AND ANSWERS.

Under this head we undertake to answer, free of charge, to the best of our ability, any pertinent inquiry pertaining to textile matters received from any regular subscriber to the TEXTILE WORLD. Questions should be stated as briefly and concisely as possible. Inquiries pertaining to textile processes, machinery, improvements, methods of management, the markets, etc., are especially invited, as well as any legitimate discussion on the views expressed. All inquiries must be accompanied by the name of the person inquiring, not for publication, but as an evidence of good faith.

Water Proofing Wood Pulp.

Editor Textile World:

Can you tell me of a good work that contains chemical recipes for water proofing ground wood pulp, either in the wet or finished state, such as pine fibre board that comes in sheets of thickness varying from one to three-sixteenths of an inch.

Ill. C. E. S.

We would suggest our correspondent writing to the publishing house of D. Van Nostrand & Co., New York, who would have such a book if there is any published on the subject.

Cement for Leather and Iron.

Editor Textile World:

I notice in your November issue an inquiry signed by J. A. T., asking for a cement that will cause leather to adhere to iron so as to stand a heavy pressure and strain. I would suggest that your correspondent try a very thick shellac.

Fibre Extracting Machine.

Editor Textile World:

Can you inform me where I may see a fibre extracting machine at work, one that extracts, especially, aloe fibre, or the sisal hemp fibre?

Ohio. R. W.

We would refer our correspondent to Charles R. Dodge, Department of Agriculture, Washington, D. C., as the best-informed person in this country on this subject.

Textile Books and Schools.

Editor Textile World:

Will you please refer me to the best books on cotton mill construction, carding, spinning and weaving. I want such books as will give me a thorough knowledge of the subject so far as such knowledge can be obtained from books.

Please inform me as to the best textile schools in England and France, and whether or not it would be better to attend one of these schools than to attend our best textile schools, expenses not considered.

S. C. J. I. B.

The best work on cotton mill construction is that by Joseph Nasmith, price, $2. While there are several good books on carding, spinning and weaving, we cannot recommend one as being superior to another. W. S. Taggart is writing several volumes on cotton spinning that, when completed, will be regarded as authority. The Student's Cotton Spinning, by Joseph Nasmith, is a book of high standing. Price, $2.50. As to a book on weaving, much depends upon the wants of our correspondent. The following are good books: Jacquard Weaving and Designing, by T. F. Bell. Price $3; Cotton Weaving and Designing, by R. R. Taylor. Price, $2.50; Cotton Weaving, by R. Marsden, $3; Mechanism of Weaving, by T. W. Fox, $2.50.

In regard to textile schools, we certainly should recommend the two schools now in this country, one at Philadelphia, and the other at Lowell. These schools compare favorably with those abroad, and in some respects are better equipped mechanically. Their course of instruction is of the best, and that which is of vital importance, it conforms to American practices. There are, of course, excellent schools in France, Germany and England. We have written our correspondent a letter, touching upon this point.

Cotton Spindles in Europe.

Editor Textile World:

Can you give me the number of cotton spindles in Europe, the amount of cotton consumed the last season, and the amount of stock on hand at the end of the season in European markets?

Connecticut. E. N.

The number of cotton spindles in Europe, according to the latest statistics, are as follows: Great Britain, 44,900,000; Russia, 6,000,000; Poland, 965,000; Sweden, 360,000; Germany, 7,884,000; Austria, 3,140,000; Switzerland, 1,710,000; Holland, 290,000; Belgium, 900,000; France, 5,300,000; Spain, 2,615,000; Portugal, 230,000; Italy, 1,886,000; Greece, 70,000. The amount of cotton in Europe consumed by this number of spindles, for the last season, is given by Ellison & Co., at 12,054,000 bales, of 500 pounds each. The amount of stock on hand at the end of the season, Sept. 30, also given by Ellison & Co., was 856,000 bales, or 360,000 bales more than the preceding season, and more than at any time since 1895. Taking the amount of stock on hand at that time for Europe and the United States, it amounted to a little over five weeks' consumption.

Manufacture of Jute, Etc.

Editor Textile World:

I am endeavoring to get some information concerning the production and manufacture of jute and other similar fibres, and I would like to have you suggest to me some literature on the subject.

New York. J. L. S.

The best literature to be obtained on this subject is that issued by the Department of Agriculture, Washington, D. C., and we would suggest writing to Charles R. Dodge, who is in charge of the division devoted to the investigation of fibres in this Department.

Common Wool Hats.

Editor Textile World:

Can you give me information about manufacturing common wool hats and machinery for the same? Is the outlook for this branch of trade favorable for fair profits? Can you suggest any other enterprise likely to be more profitable in this section?

North Carolina. J. S.

It would be very difficult for us to say what line of industry our correspondent should engage in. This matter would have to be left entirely to his own good judgment. As to the manufacture of common wool hats, the present prospects are not so favorable when brought into competition with those made of fur. Fur hats can now be made at such a low cost that it hardly pays to make a wool hat, which is looked upon as not so good. We have written our correspondent in regard to sources whence he can obtain the necessary machinery. A good deal of the machinery that is used in the manufacture of hats is built by the manufacturer himself, suitable to his special needs. There is some second-hand machinery for this purpose to be had of parties who are contemplating retiring from this kind of business.

National Bankruptcy Law.

Editor Textile World:

Can you tell me briefly the provisions of the national bankruptcy law which passed the last Congress, and when it went into effect?

Mass. S. C. W.

The law went into effect at once, on its passage, July 1, 1898, but no petition for voluntary bankruptcy could be filed until Aug. 1 following, and no petition for involuntary bankruptcy could be filed until November 1. That is, after August 1, a man may voluntarily become a bankrupt, and before November 1 his creditors could not have compelled him to become one. The provisions of the law are numerous and more or less confusing even to a lawyer, and are destined to result in many differences of opinion, and many bitter controversies are likely to be the result. Any person who owes debts, except a corporation, may apply to a court to have himself adjudged a bankrupt.

A Knot to be Untied.

Editor Textile World:

Can you untie this knot for one of your subscribers? Take, for instance, a quarter-blood wool, and after sorting take the long staple, prepare, comb and dye it in the slubbing any color, or to be specific, say brown; then take the shorter staple from the same wool, card, comb and dye the same color as the other, and when both are made into filling, weave one-half piece with short staple and one-half piece with long staple. Please tell me why the long stock shrinks 1½ to 2 inches more than the short stock, in the process of finishing. To state the matter further, with more particulars, I will put it in this form:

Take quarter-blood wool and make the following sorts, say four, besides fribs, etc., make two sorts of the longer staple, calling them 1s and 2s, and two of the shorter staples, which we will call 9s and 4s, corresponding in quality, one with the other, differing only in the length of the staple.

The long staple wool is taken and prepared separately and mixed in the ball before dyeing. It is then dyed and combed The 9s and 4s, or the short staple wool, is carded and mixed in the ball much the same as the long, which is also dyed and combed. They are put through different sets of drawing, but with much the same twist, and in spinning they have the same twist and are spun to the same counts. We will then take them to the weave room, and weave half the piece with, say, yarn made from the short staple, and then change to the yarn made from the long staple and weave the remaining half.

We will then take the piece into the finishing room, run it through the pad or finishing machine, and the result will be, after running through water, a difference in width from 1½" to 2", and the greatest shrinkage takes place in the long staple wool.

If you could give me any reason or cause for the difference, you would greatly oblige me.

New York G. J.

Our correspondent has put to us, surely, a question that will be very difficult for us, and we fear, for others, to answer. In order to get at the true reason for the difference referred to, it would become necessary for one to follow the stock from its raw state to its condition in the finished fabric. There may be several causes for the difference, some of which we have communicated, privately, to our correspondent. As a general thing we should not expect to see a manufacturer mix yarns in this way, in weaving, as unlike results would naturally follow in one or more particulars. We should be pleased to hear from any of our readers concerning their impressions of the causes leading to the above results.

Army Expenditures.

Editor Textile World:

Can you give me the expenditures by European countries for army and naval purposes?

Mass. C. C. F.

According to the best information that we have, the army and navy expenditures at the present time by European nations, are as follows:

Armies: France, $124,400,000; Russia, $150,600,000; Germany, $146,200,000; Austria, $74,800,000; Italy, $47,200,000, and England, $91,600,000.

Navies: France, $51,600,000; Russia, $31,800,000; Germany, $24,200,000; Austria, $80,800,000; Italy, $67,400,000, and England, $203,200,000.

According to a London correspondent of one of our exchanges, it appears that in 1845, with a population of 27,400,000, England expended in all $268,500,000, and of this, there was spent on armament, $78,000,000. In other words, the British total budget was roughly $10 per head of population, of which $2.75 was armament. Now the expenditures run to an insurance premium of 6 per cent. on the whole foreign and colonial trade of Great Britain. Unless the present expenditure is reduced, the nations of Europe have nothing but revolutions and bankruptcy before them. The above figures are significant of the immense financial strain that is put upon the industrial classes of Europe, to sustain national readiness for war.

Starting a Dynamo.

Editor Textile World:

(a) How would you start a shunt wound dynamo?

(b) How would you start a series wound dynamo?

You will greatly oblige me by answering these questions.

Buffalo, N. Y. P. P. H.

(a) In starting a shunt wound dynamo be sure that the brushes are properly set, that is, if a two pole machine, the tips of brushes should be at diametrically opposite points of the commutator, and if a four pole machine having four sets of brushes, the tips of the brushes should be set on the quarter, or an equal number of segments should lie between the tips of all four sets. These brushes should have a firm but not hard contact with the commutator, the machine may then be brought up to speed and voltage raised by means of the rheostat which cuts resistance out of the shunt field circuit. When voltage is right as indicated by volt meter or pilot lamp, main switch may be closed and voltage and brushes adjusted according to load. The directions apply also to compound wound dynamos.

(b) With series wound machines there is usually a regulating device for automatically shifting the brushes. In starting up machines of this type, the brushes should be set properly and after machine is up to speed, raise the regulator to the point of lightest load and close the external circuit. Regulator will take care of itself according to the load there is on the machine.

Capacity of Coal Bunker.

Editor Textile World:

How can I find the number of tons of coal a certain size bunker will contain?

C. G. L.

Cumberland coal will on the average, measure about 42 cubic feet to the ton. Now if you had a bin 10 feet long, 5 feet wide, and five feet high it would contain, 5′x5′x10′ or 250 cubic feet, and would hold as many tons of coal as 42 is contained in 250 or 250÷42=6 tons.

Ratio of Expansion.

Editor Textile World:

How do you find the ratio of expansion in a compound engine?

Springfield, Mass. G. H. W.

Assume the following data for illustration. Cylinders 20 and 40 inches in diameter by 48 inch stroke, clearance 3 per cent. or 12/100 feet. First find the ratio of expansion of the high pressure cylinder.

To find the ratio of expansion divide the length of the stroke in feet (plus the clearance in feet) by the distance the piston has traveled at point of cut-off (plus the clearance in feet). Thus supposing the cut-off to be at ¼ stroke or a ratio of 4 then (4+0.12) ÷ (4÷ [4+0.12]) or 4.12÷.97= 4.24 which is ratio of expansion in the first cylinder. If the cut-off on both cylinders was the same the same ratio would exist in the low pressure cylinder and the total ratio of expansion would be 17.97, or for every volume of steam admitted into the high pressure cylinder it would be expanded 17.97 times its original volume.

Capacity of a Tank.

Editor Textile World:

Will you please explain how to figure out the capacity of a round tank, 5 feet in diameter with a flat bottom?

Castine, Maine. L. C. G.

Square the diameter, that is 5x5 = 25, multiply this by .7854 which is 19.63 square feet and the area of the tank bottom. If the water in the tank was one foot in depth there would be 19.63 cubic feet, if the water was two feet deep, there would

be 2x19.63 cubic feet, if five feet deep, 5x19.63 or 98.15 cubic feet.

A cubic foot of water weighs 62.5 pounds and 98.15 cubic feet would weigh, 62.5x98.15 or 6134.37 pounds.

A standard gallon weighs 8.33 pounds and 6134.37 divided by 8.33 = 736.4 gallons which would be the quantity of water contained in a tank 5 feet in diameter and 5 feet long or high.

New Publications.

"Modern Methods." The Link-Belt Machinery Co., of Chicago, have issued their new pocket catalogue No. 25. This is their general catalogue covering their very extensive line of all kinds of power transmitting machinery, elevators, gearing, link-belting, chains, conveyors, and hundreds of auxiliary machines and parts which go to make up the system that they have developed of handling raw and manufactured products economically and automatically, as well as power transmitting machinery, rope driving, etc. The catalogue also contains tables pertaining to this kind of machinery of much value for reference. Rare judgment has been exercised in the compilation of the catalogue, showing such great diversity of machinery, and the work has been exceedingly well done, while the complete system of indexing renders reference to any desired information in a moment's time. Besides this general catalogue and price-list, they have special catalogues for the different departments of electric, coal mining and haulage machinery.

Motors and Generators. The B. F. Sturtevant Co., Boston, Mass., have issued what they term their Bulletin F, illustrating and describing their motors and generators for direct current. They make the bi-polar medium speed, and the multi-polar medium speed motors; also, the bi-polar medium speed and the multipolar medium speed generators. A complete description of the motors and generators is given in this bulletin, which should be of interest to manufacturers.

Appleton's Popular Science Monthly, for December. New York: D. Appleton & Co. Price $5 per year. This issue has the usual number of scientific articles, written so that they can be readily comprehended by any intelligent person. The articles are written in a popular style, more or less illustrated. Edward Atkinson has a sharp reply to the recent address of Sir William Crooke, on the wheat supply of the world, in which he maintained that the ability of the United States as a wheat producing country had been nearly reached. Mr. Atkinson disputes this. A very attractive, illustrated account is given of a trip up the Skeena River, in British Columbia, which abounds in the grandest forms of scenery. This country is of extreme interest to the ethnologist, on account of its native population. Other popular articles also appear.

Power Pumps. This is the title of a new and complete catalogue of triplex power pumps, made by the Goulds Manufacturing Co., Seneca Falls, N. Y. This catalogue has just been issued from the press, and is something of interest to our readers. This catalogue contains much matter of general interest, in relation to power pumps, in connection with which valuable tables are given. It is well worth having for the information that it contains, and we would suggest writing for it to the publishers. These pumps are applicable for most everything in the hydraulic line, as for artesian wells, boiler feeds, brewery purposes, drainage, quarries, oil refineries, paper mills, etc., etc.

Color Cards. Farbenfabriken of Elberfeld Company, New York, have sent out a number of color cards of interest to dyers, which can be had upon application, showing one-half wool eskimo fabrics dyed in one bath; fashionable shades, fast to light in ladies' dress goods; alizarine and chrome colors dyed on chrome and discharge cotton material and mercerized: samples of Chrome Yellow G on wool cloth and yarn; and Phenol Black S S on men's wear suitings. We particularly desire to call attention to their card of dyeings on mercerized materials.

Two-Color Effects. This is the title of a color sheet issued by Wm. J. Matheson & Co., New York, showing two-color effects produced on wool, by printing with soda lye. The object is to show that the same effect may be obtained by this process as that on cotton that has been printed with soda lye and then dyed with diamine colors. The manner of dyeing this can be ascertained by writing for one of these circulars.

Embroideries and Embroidery Machines, by Alfred F. Barker. Manchester, England: John Heywood. Illustrated. 71 pages. Price $1.25. This is a work written by the head of the textile department of Bradford Technical College, England, and treats of the recent inventions in embroidery machines and their capabilities. The author is a sufficient assurance of the merit of the work, on this subject. The art of embroidery is being introduced more and more into the fabrication of textile fabrics, to produce artistic and beautiful effects. This especially relates to goods for women's wear. The ornamentation may be effected either during or subsequent to the weaving operation, though from an economical point of view the first method is preferable; but, of late years, such excellent results have been obtained by the latter method, unobtainable in any other way, that there is now no question as to its success, either from an economical or artistic point of view.

The Columbia Calendar for 1899. Hartford, Conn.: Pope Manufacturing Company. We are in receipt of the 14th edition of the well known and very useful little memorandum pad published by this company. This handy calendar has been for many years one of the most pleasing of special advertising features. It is similar in design and make-up to the 1898 calendar, though it has more artistic covers and is more profusely illustrated. Any person can obtain a copy by applying to the nearest Columbia dealer, or by sending five two-cent stamps to the Calendar Department, Pope Manufacturing Company, Hartford, Ct.

Aniline Colors: Bosson & Lane, 36 Central Wharf, Boston, Mass., have just issued an attractive color card, showing the effects of some of their aniline colors on cotton yarn (mercerized and unmercerized). It is an exceedingly attractive card, and we would suggest dyers writ-

ing for it. Recipes are given for their production.

The Yale Review: New Haven, Ct.: Tuttle, Moorhouse & Taylor, price, $3.00 per annum. This excellent quarterly journal, issued under the auspices of the Yale University, New Haven, and given to the scientific discussions of economic, political and social questions, appears in its November number with a most valuable contents, as follows: The Coin Shilling of Massachusetts Bay; Industrial Democracy; Dominion Politics in 1898; The Tin Plate Industry; Railway Receiverships in the United States: Their Origin and Development.

Industrial News.

—Four large electric fans, having a combined capacity of 134,000 cubic feet of air per minute have recently been set up in connection with the Boston subway, for the purpose of securing the necessary ventilation. They were designed, constructed and installed by the B. F. Sturtevant Co. of Boston, Mass.

—As there appears to be some confusion in regard to type marks of Egyptian cotton shipped by Carver & Co., Alexandria, to Stoddard, Haserick, Richards & Co., Boston, it is well to say that all bales thus shipped have the letters, "C. B. C." on the ends of the bales as well as the type mark.

—Frank E. Field, New Haven, Ct., successor to H. M. Wesson & Co., has very satisfactory reports from manufacturers who are using the Wesson-Wilson belt hooks, which he manufactures. These hooks have many important advantages. Among them may be mentioned that they are self clinching, and made from the finest quality of malleable iron. They are capable of standing the severest test. These hooks are not unknown to manufacturers, having been in use for a great many years, and no complaints have been made of their breaking. Mr. Field would be glad to send samples to interested parties, upon application.

—S. Myers & Sons, Tiffin, Ohio, offer the Tiffin Woolen Mills for sale, as may be noticed in their advertisement, to be found with the special advertisements in this issue. This sale is for the purpose of closing up the estate of Samuel S. Myers, deceased. It is represented to us as being a valuable piece of property for woolen manufacturing, being a mill of six sets of machinery, all in good order. Those in want of such property would do well to correspond with the above parties for more particulars.

—During the past summer the Joseph Dixon Crucible Company of Jersey City, N. J., have added an extension to their pencil factory, 40 by 90 feet, three stories high. The same is driven by electric power from generator placed in the main factory. No expense has been spared in the equipment of this addition in the way of up-to-date elevators, furnaces, dry rooms, etc. The Company will also put down an artesian well, several hundred feet in depth, for a supply of water for factory use, and sometime during 1899 various other additions will be built to the Dixon Company's very extensive plant. The Dixon Company was established in 1827, but during all of its more than three score years and ten of busy life, no year has in any way equaled 1898 for volume of business. The Dixon Company's products go into every known field of industry; the iron workers, the brass workers, the printing trades, the stationers, the cycle manufacturers, the hat manufacturers, the paper mills, etc.

—Professor C. P. Brooks of Lowell has accepted an appointment as managing director of the new textile school in New Bedford. The head office of the American Correspondence School of Textiles, of which Professor Brooks will retain the directorship, will be removed to New Bedford about the last of the year, a branch office being retained in Lowell. The new textile school in New Bedford will be located in its own building, which the trustees are now erecting on one of the leading business streets, and will give especial attention to cotton picking, carding, spinning of coarse, medium and fine yarns and in weaving and designing of all kinds of fabrics. A complete equipment of machinery has been arranged for, and will be representative of the productions of all prominent American machine builders. The school is being erected from appropriations made by the State of Massachusetts and city of New Bedford, amounting to $50,000, and the board of trustees comprises many of the leading manufacturers of Southern Massachusetts. Many manufacturing cities in the neighborhood of New Bedford, such as Fall River, Providence, Taunton, Pawtucket and others are expected to be greatly benefited by the establishment of this school.

—Howland Croft, Sons & Co., Camden, N. J., have opened an office in Providence, R. I., and are there represented by Firth Broadhead, 937 Banigan Bldg.

—The Bates attachment, manufactured by Bates & Judson, Lowell, Mass., for the Apperly feed, is advertised elsewhere in this issue. This attachment is recommended as insuring even feed to the finisher card, making sides and middle weigh the same. This attachment is constructed by positively driven, fluted distributing rolls that mesh into one another. These rolls lay the drawing on the feed without any strain and prevent the stock from dropping on the floor outside of the card. With these rolls it is claimed that a card will make less waste, evener roving, and stronger yarn, besides a bigger production of cloth. Quite a number of mills are now using this attachment with satisfactory results.

—The Farbenfabriken of Elberfeld Co., New York, have recently put upon the market a product known as Chrome Yellow G, which is not only adapted for wool dyeing, slubbing and printing, but can also be employed for cotton printing, in a similar manner, as Chrome Yellow D, sold by the same house. It is printed with acetate of chrome, on oiled or unoiled cotton cloth, steamed, chalked or soaped.

—Manufacturers of knitted underwear, in the Northern States, should look to their laurels, as the South is making rapid strides in the installation of plants for knitting. Scott & Williams, the well-known knitting machine builders of Philadelphia, report their capacity taxed with orders for Southern mills.

—Scott & Williams of Philadelphia, knitting machine builders, report a gradual improvement in the demand for their machines.

—The latest Scott & Williams' machines for knitting hosiery and underwear may be seen at the plant of the Campbell Manufacturing Company at Bennington, Vt., and L. C. Smith, Boston, Mass.

—The Statesville Cotton Mills, Statesville, N. C., have recently placed a repeat order for picking machinery, cards and drawing, with the Howard & Bullough American Machine Co., Pawtucket, R. I. The Talladega Cotton Factory, Talladega, Ala., is enlarging its mill, in order to make room for eight new spinning frames and all preparatory machinery, soon to be received from the foregoing company, which has also received an order for the entire equipment of the Gold Crown Hosiery Mills, Charlotte, N. C., for spinning hosiery yarns, for which purpose a special building is being erected.

—The Berlin Iron Bridge Co., East Berlin, Ct., were the contractors for furnishing and erecting the new bridge for the town of Bridgton, Me., which is built of steel throughout, except the floor planking. This company has received the contract for furnishing the structural iron work for the new church now being put up in Winsted, Ct. This company is also erecting for the Seamless Metal Co., Sing Sing, N. Y., across the railroad tracks, connecting the different parts of their plant, a steel foot-bridge, consisting of lattice trusses about 68 feet long, supported on steel trestle bents on either end. Underneath the bridge is a substantial trolley beam, designed to carry loads from the adjoining building to the switch track of the railroad underneath the bridge. The steel work for the generator room and the engine room for the United Gas Improvement Co., Waterbury, Ct., is being erected by the East Berlin Company. The roofs are to have steel trusses, supporting the roof covering, which will be of corrugated iron, lined with the Berlin Iron Bridge Company's patent anti-condensation fire proof lining.

—We have just received proof sheets of a very interesting pamphlet entitled "The Textile Mill, the Dyehouse, the Bleachery, from the Financial Standpoint," and from our perusal of same we feel that it will prove both profitable and interesting reading to those financially and otherwise interested in the textile and allied trades. The book is being published by the New York Filter Manufacturing Co., 26 Cortlandt St., New York, and we would suggest our readers applying to them for a copy of the pamphlet as soon as it is issued. We understand from them that it will be furnished gratis to those applying for the same.

—The Philadelphia Textile Machinery Co., Philadelphia, have just shipped a "Cyclone" automatic cotton stock dryer to the Great Falls Bleachery and Dye Works, Somersworth, N. H., and if you see fit to make note of it in your coming issue we shall be glad to see it.

—The B. F. Sturtevant Co. of Boston, Mass., have just issued a second edition of their very suggestive pamphlet, Bulletin E., entitled "Draft Without a Chimney." We understand that it will be mailed on application.

—At Mystic, Ct., the Mystic Mfg. Co. are running full time on fine fancy worsteds. The Rossie Velvet Co. are very busy, and adding new looms and spoolers. Rawitser & Brother's mill is running on full time. John Fraiser has succeeded the late John Ireland as superintendent.

—The Ashaway Woolen Co., Ashaway, R. I., is running on full time making fancy cassimeres and fancy black cloakings. James Murphy is the superintendent, and has the mill well organized and most conveniently arranged for economical work.

—One of Schuylkill Haven's varied industries is the bleachery plant of Samuel Rowland, which was established about a year ago, and since that time a large and prosperous trade has been established, including many manufacturers in the Schuylkill Valley, who find it advantageous to send their goods to an expert. The machinery employed is of the most modern make. Mr. Rowland is a thoroughly practical man, and his list of customers is steadily increasing.

—A suit has recently been filed by the New York Filter Manufacturing Co., New York, in the United States Circuit Court, for the Eastern district of Missouri, against Powell Jackson, or the Jackson Filter Co., of St. Louis, who are making what is known as the Jackson filter. These filters are alleged to be manufactured and operated in violation of certain patent rights belonging to the New York company, covering the use of coagulants such as alum and sulphate of alumina, in connection with filtration. It is the intention of the New York company to prosecute all users of the Jackson filters, as well, unless suitable indemnity for infringement is paid them, within a reasonable time. Pending the suit, an injunction has been called for against the Jackson Filter Company.

Philadelphia Worsted Co.

William J. Weihenmayer, who has for a number of years been connected with Edward T. Steel & Co., Bristol, Pa., during the last few years as superintendent, will shortly sever his connections with this firm and take an active part as secretary and treasurer in the affairs of the Philadelphia Worsted Co., commission wool scourers and combers. This company was organized a little over a year ago and the business has since been conducted by the president, Charles H. Thomason, formerly head comber for Edward T. Steel & Co., Bristol, Pa., Joseph Turner & Sons, Cleveland, Ohio, and the Atlantic Mills, Providence, R. I., who is thoroughly practical in all branches of the worsted business, which insures first-class work to all parties who may send them stock. Their mill, formerly located at American and Diamond Sts., Philadelphia, was removed to 74-84 Erie St., Camden, N. J., on Jan. 1st, 1898, in order to procure a building adapted in every respect to the requirements of the business.

Electricity in Mills.

A paragraph recently appeared in a Southern textile journal reflecting upon the General Electric Co.'s installation in the mill of the Pelzer Manufacturing Co. It is so grossly inaccurate and so manifestly unfair to that company and also to the Pelzer Company, that we take pleasure in publishing the following statement, made by Captain Ellison A.

Smyth, president of the Pelzer Company, in regard to the matter. "The Pelzer Manufacturing Company has no intention of immediately building another mill or developing other water powers that they now own, as stated. The most serious mistake is in reference to the electric drive in mill No. 4. We have over 75,000 spindles being driven by power transmitted by electricity two and five-eighths miles, and while there has been some trouble wih the induction motors in mill No. 4, owing to several causes, these causes are doubtless inseparable from the development of this distinctly new feature in industrial progress, and it should be borne in mind that we have at Pelzer the largest installation of induction motors in the world, and that they are working in cotton mills under trying conditions. The statement in the —— —— is both unfair and grossly exaggerated."

President Tuttle on the Proposed New Freight Schedule.

In a recently published interview, President Lucius Tuttle of the Boston & Maine Railroad effectually disposes of the so-called "Baltimore plan" to reorganize the present basis of freight schedules adopted by the railroads of the United States by substituting a tariff of so much per ton per mile.

This scheme is the outgrowth of an effort on the part of the business men of Baltimore to forestall any unfavorable result upon the export trade of that city growing out of the enforced dissolution of the Joint Traffic Association, and it is announced that they intend to petition Congress to enact a law placing railroad freight rates on that revolutionary basis.

President Tuttle, while pointing out that the idea is wholly impracticable, and giving as his opinion that it will be a long time before the present "block" system of making railroad freight tariffs in this country is superseded by any other arrangement, at the same time presents some logical and forceful arguments in favor of large railroad systems, of which the Boston & Maine is itself an excellent example.

In the course of his statement, Mr. Tuttle says: "Competition between roads brings about that rate cutting which may prove disastrous to those for whose benefit it was ostensibly devised. The competition here is no longer that of one town against another, but a contest in which New England is pitted against every part of the country in the attempt to market its products and manufactures in every part of the world. A great system of railroads can give to every customer upon its line equal territorial facilities for marketing its goods, and through its connections with similarly powerful systems makes its customers competitors everywhere under the most advantageous conditions. The effort of the railway manager today is directed to the cheapening of rates so that his customers can get their goods into the markets of the world so as to compete with those situated upon other systems, rather than to get more money out of the shippers or receivers upon his line. Thus the competition becomes territorial rather than local, and a great system, embracing a section, can best deal with the question and give those within its jurisdiction the better and cheapest service.

"The railroad business is not in a satisfactory way, notwithstanding the efforts of the Interstate Commission and the use of various expedients from which much was expected. The solution of the problem is one that taxes the ingenuity of practical railroad men and they are very much at a loss what to do. Is it reasonable to suppose that others who possess no natural aptitude for the work or experience in it, can settle this matter, as is proposed by the Baltimore plan? When each section of the country has its own transportation system whose interest in establishing fair rates would be as great as the maintenance of them afterward, then will the troubles now complained of disappear largely and a better state of things prevail for everyone concerned."

Woolen and Worsted Overseers.

Overseers in woolen mills in various parts of the country convened last month at the United States Hotel, Boston, it being the annual meeting of the National Association of Woolen and Worsted Overseers. Officers were elected as follows for the ensuing year: President, A. E. Jones; vice-presidents, Herman Amback, T. F. Brennan and Louis Cormack; secretary, John Mulrooney; treasurer, Albert E. Jones. John O. Crowley, F. H. Graichen and J. H. Pickford were elected members of the board of trustees; G. W. Burr was elected secretary, and Albert E. Jones treasurer of the beneficiary department. The following-named were elected to honorary membership: Sydney Harwood and W. H. Drury of Boston, M. A. Furbush, J. K. Proctor and C. W. Schwartz of Philadelphia and E. A. Baldwin of North Adams; and the following named were elected to active membership: Jonathan Hartley of Lowell, W. O. Philbrick of Worcester, Edward A. Leasuer of Connecticut, Thomas H. Anderson of Skowhegan, Edward J. Feeley of Pittsfield and Albert E. Schoon of Canada. Eight members joined the beneficiary department during the year.

The object of this organization is to exchange ideas on different methods and processes of manufacturing and to aid in general dissemination of knowledge pertaining to the growth and manufacture of wool.

Carbonizing, Dyeing, Etc.

The Lee Woolen Company, who were burned out at Lee, Mass., several months ago, are now well established in their new quarters at Springfield, and have their plant equipped in first-class shape. They make a specialty of custom work, and have built up a good trade among manufacturers, and will be glad to correspond with others who want good work, prompt service and satisfactory prices. They are prepared to do carbonizing, dyeing, picking and carding, and solicit correspondence.

Waverly Worsted Mills.

The Waverly Worsted Mills, of which William H. Humphreys is manager, have recently started on Main St. and Green Lane, Manayunk, Pa. They have drawing and spinning. Mr. Humphreys is a thoroughly posted man in this department and is well known to the trade. They manufacture worsted yarns for weaving and knitting and invite correspondence.

The Industrial Commission.

The Industrial Commission at their session, Nov. 17, selected the following sub-commissions:

On Agriculture—Harris, chairman; Kyle, Mantle, Gardner and Conger.

On Manufactures—Smith, Penrose, Livingston, North and Farquhar.

On Mining—Daniels, Otjen, Bell, Ratchford and Farquhar.

On Transportation—Philipps, Mallory, Lorimer, Harris (N. C.) and Kennedy.

Silkaline.

John C. Meyer & Co., 87 Summer St., Boston, are doing a large business in Meyer Silkaline, which they make expressly for catstitch machines. It has all the appearance of silk, and has proved very popular. They furnish it in all sizes and colors on spools or cones. Their line includes all varieties of spun and reel spool embroidering silks as well as cotton thread on spools and cones. This firm does a large business among the knitting mills, and is constantly making new customers.

Recent Sales of Mill Shares.

	Lowest.	Highest.
Stafford	90	90
Union	130	130
Arlington	100⅜	100⅜
Wamsutta	77¼	79¼
Lawrence	105½	105½
Merrimack	900	902½
Barnaby	70	70
Davol	85	85
Massachusetts	77½	80¼
Massachusetts (Georgia)	110¾	110¾
Lowell	500	500
Great Falls	144¾	145⅛
Amoskeag	1450	1452½
Great Falls	145	145⅛
Nashua	530	572½
Amory	122	122
Sagamore	79	79
Bates	100½	100½
Stark	830	932½
Pacific	1912½	1912½
Chicopee	58	58
Cocheco	167½	167½
Pepperell	1360	1360
Lyman	46¼	47

MILL NEWS.

Cotton.

New Mills.

—Alabama, Demopolis. The establishment of a cotton rope mill is projected at this place. T. L. Sharpe is interested, and desires to receive estimates on machiery, etc. If the affair materializes, a plant for using two to three bales of cotton daily will be purchased.

—Alabama, Faunsdale. J. H. Minge & Son are interested in the establishment of a cotton-rope and wrapping-twine mill at this place. They desire to receive information concerning the manufacture of these products, and estimates on machinery.

—*Alabama, Florence. F. M. Perry informs us that he has bought the Cypress Mill property and is making improvements on it. He expects to put in machinery next fall. It will be remembered that Mr. Perry's plans included an electric light for the purpose of lighting the town of Florence and a cotton mill.

—Alabama, Mobile. A company has been organized at this place with a capital stock of $100,000, for the production of yarns, to be known as the Mobile Cotton Mill. The erection of the building will be commenced immediately, in which, when completed, 5,000 spindles will be installed. J. T. Dumas is president, and Murray Dunlap, secretary, with the following directors: Chas. Herin, L. Touart, J. Pollock, L. Hammel, J. A. Watters, J. T. Dumas, M. R. Dunlap and R. J. Heustis.

—Georgia, Carlton. A cotton mill is being projected at this place by Joseph E. Watson and associates. The projectors are willing to furnish the water power with 100 acres of land at $15,000, taking the value in stock. Mr. Watson informs us that he is at present in communication with a manufacturer who says that he will erect a $100,000 plant if the town can raise half the necessary capital.

—Georgia, Commonwealth. "The Christian Commonwealth" are building a weave shed in connection with other industries at this place, and will install 20 looms at the start. Later on they intend to put in fancy looms. F. J. Loiselle, superintendent of the cotton department has the matter in hand.

—*Georgia, Rockmart. The New York Mills inform us that their plans are not sufficiently advanced to give out details concerning their new mill beyond the fact that it will be located in Northwestern Georgia, some miles from Rockmart, at a place called Long. There is, as yet, no post-office at Long, we believe.

—*Georgia, Columbus. Vigorous efforts are being made towards raising capital stock for the new Columbus Mfg. Co. Most of the prominent business men of Columbus are interested and there seems a good prospect for the ultimate success of the enterprise.

—*Georgia, Madison. Further information is at hand regarding the new company being formed at this place for the erection of a spinning mill. J. L. Sexton & Co., machinery dealers of Charlotte, have offered to subscribe $10,000 to the stock, provided a total of $100,000 is subscribed. William A. Broughton has offered a site free and will take about $25,000 worth of stock. Others interested so far are H. T. Shaw, B. P. Few, R. U. Thomason, S. B. Alexander, and others. If the matter is consummated, a $20,000 building will be erected, together with a number of dwellings, etc.

—*Georgia, Lexington. There is a well defined rumor to the effect that a new coton mill may be built within twelve miles of Lexington, near Carlton. It is stated that a $100,000 plant will be established. About a year ago, a mill was projected at Lexington, but it was finally abandoned. W. S. Whitham, president of the Bank of Lexington, and Dr. E. Cheedar, were the leading spirits at that time, and may be interested in the present scheme, but this is not positively known to be a fact.

—*Georgia, Manlo. We are informed that the erection of the proposed cotton mill at this place is a matter of much uncertainty as yet.

—*Georgia, Whitehall. The building for the use of the Whitehall Yarn Mill, John R. White, proprietor, is about completed, and will, in a few days, be ready for the new machinery. Full details of this project were given in our issue of Oct. 1st.

—*North Carolina, Concord. Machinery is now being placed in position in the mill of the Coleman Mfg. Co. This is the mill which we mentioned recently as having been organized by negroes and which will be operated by colored labor. The capital stock is $50,000; Warren C. Coleman is secretary and treasurer. The mill is 80 by 120 feet, 3 stories high. Equipment will be about 7,000 spindles.

—*North Carolina, Kinston. The Kinston Cotton Mills inform us that they expect to commence work about the 15th of this month, and will employ 75 persons to start, manufacturing hosiery yarns on cones in numbers 8 to 22. 3250 spindles will be operated. The company is capitalized at $59,000, with W. C. Fields, president; J. F. Taylor, treasurer and agent, and S. W. Oliver, superintendent.

—*North Carolina, Taylorville. The contract has been awarded for the addition which we reported September 16th would be built by the Moore Cotton Mfg. Co., at this place, and when completed, the new machinery necessary for doubling the capacity of the plant will be installed.

—Pennsylvania, Philadelphia. A new company manufacturing turkey red damask will locate in the Aramingo Mills, Frankford. The concern will trade under the name of Wall & Davies. They expect to be in operation at an early date.

—South Carolina, Columbia. Articles of incorporation were issued Nov. 1st to to a new cotton mill company under the name of the Palmetto Cotton Mills, with the following as incorporators: George A. Shields, W. P. Roof, T. J. Harper, Ira N. Hayes, C. M. Pegram and J. B. Friday. The initial capital stock is $125,000. It is the intention of the projectors to largely increase and probably double it as soon as possible after the beginning of operations. Part of the machinery necessary will be purchased from the defunct Elmwood Mill, which the projectors proposed to operate with colored labor and which came to grief and was sold out. Some machinery, however, will be purchased direct from the makers and possibly an order for $50,000 worth of power and operating machinery will be given out by this company within a year. The new mill will be built on the property of T. J. Harper in the suburbs of the city of Columbia, and the S. C. & Ga. R.R. will lay a spur from the main line to the property. All the stock for the initial capitalization has been already taken up.

—*South Carolina, Lando. The Manetta Mills, which will be rebuilt at once, will contain 5,000 spindles for hosiery yarns. Mr. Heath informs us that production is expected to begin about March or April, 1899. The officers are B. D. Heath, president; J. C. Gregson, treasurer and superintendent. Mr. Heath's address is Charlotte, N. C.

—*South Carolina, McColl. The new mill company organized here a few days ago, which we announced last week has been incorporated by T. B. Gibson and others, will be named the Marie Cotton Manufacturing Co. Only $50,000 will be put into the plant to start, but the main building will be built with a view to enlargement and addition later on.

—*South Carolina, Orangeburg. The Enterprise Mills are about to purchase a complete equipment for the manufacture of cotton yarns with the $75,000 in bonds issued recently. It is planned to have an equipment of 11,200 spindles and 350 looms, also an electric lighting plant. Full details of this concern were printed in our issue of June 10th. Mr. Samuel Dibble, president, and Arthur Whittam, treasurer and superintendent, have recently been in the East arranging for the necessary machinery.

—Texas, Corsicana. Mrs. Anna Shelton of Dallas, is contemplating the erection of a batting mill at this place. Mrs. Shelton already possesses the complete equipment of machinery for the production of cotton batting.

—Texas, Corsicana. Goverenor George T. Jester and associates are contemplating the erection of a cotton mill at this place. J. A. Smith of Bessemer City, N. C., is also interested, but not as a principal.

—*Texas, Dallas. The projectors of the cotton mill in which P. Sanger is largely interested, report that the success of the project is assured, and that a mill, which will represent an investment of over half a million dollars, is to be the outcome.

—*Texas, Waco. Additional particulars have been received in regard to the projected cotton mill at this place. J. B. Baker, chairman of the temporary cotton mill organization has received a communication from G. G. Benedict, 186 Monroe St., Chicago, and J. B. Keeney, in which the latter offers to put a 10,000-spindle plant, valued at $125,000 into the Waco enterprise, if the people of that city will take $50,000 worth of stock in the new company. If this is the old Allegheny plant now stored at Fulton, the Waco people will not accept, indeed the question of second hand equipment is not considered very favorably by some.

—*Texas, Waxahachie. It is reported that $75,000 capital stock of the proposed cotton mill at this place is practically assured, and probably within sixty days, work will commence on the plant.

Enlargements and Improvements.

—*Georgia, Covington. Work on the new mill of the Porterdale Mill has progressed, and much of the additional machinery has already arrived and been installed.

—Maine, Biddeford. It is said that all the mules in No. 2 mule room in the Pepperell Mfg. Co's mill have been thrown out and that ring spinning frames are being installed in their places.

—Maine, Westbrook. The Dana Warp Mill is running night and day, and it is

reported that an enlargement of the factory will be necessary, so that it has been decided to add a third story to part of the mill.

—Massachusetts, Fall River. It is said that the Barnaby Mfg. Co. are considering the erection of another addition to their gingham mills.

—Massachusetts, New Bedford. A one story addition, 64 by 74 feet, will be built to the east wing of the Acushnet Mill Corporation.

—*Massachusetts, West Warren. Extensive repairs and improvements are being made to the Warren Cotton Mills, which we reported last week had been purchased by the Thorndyke Co. The dye house near the bridge is being enlarged, and the machinery in No. 4 mill will be installed in Nos. 2 and 3 as soon as it is in a suitable condition. It is expected that some cotton will go through next week. The new superintendent is George A. Moody, lately with the Strafford Co., Pawtucket, R. I.

—New Hampshire, Somersworth. The Great Falls Mfg. Co. are about to install 100 Northrop looms in their No. 1 mill to take the place of the old drop box looms. Many other repairs and improvements are being made about the mills.

—New Jersey, Carlton Hill. The Standard Bleachery is making improvements to the building and bleachery.

—New Jersey, Gloucester City. We are informed that the Gloucester Mfg. Co. is about to make large additions to its present plant, ground for which purpose has already been purchased. The extent of the additions is not definitely known, but it is thought that it will be sufficiently extensive to employ several hundred additional hands.

—*North Carolina, Burlington. The Aurora Cotton Mill is now receiving machinery for a new plant, which increases the capacity from 4,500 to 12,000 spindles.

—North Carolina, Charlotte. The Magnolia Webbing Co., manufacturers of back bands, etc., will add the manufacture of hammocks and kindred goods.

—North Carolina, Charlotte. The Louise Mill has added a few dobby heads to some of the looms for experimental purposes, and if found satisfactory they will enter largely upon the manufacture of fancy weaves.

—*North Carolina, Cherryville. The Gaston Mfg. Co. inform us that they expect the new addition will be completed and production of the goods commenced Jan. 1st, 1899. Number of new spindles will be 3328, and 96 looms; steam power.

—North Carolina, China Grove. The Paterson Mills are reported as contemplating large additions to their plant, in the way of additional buildings and machinery.

—North Carolina, Roanoke Rapids. New looms with dobby heads have been installed in the Roanoke Mills here.

—*North Carolina, Taylorsville. J. H. Moore of the Moore Cotton Mfg. Co., reports that the foundation of the addition to the mills is now completed and it is expected that the building will be finished by Dec. 1st. Part of the new machinery has arrived and balance is ready for shipment, and it is expected that the mill will be running by Jan. 1st of the coming year.

—Pennsylvania, Conshohocken. A large addition is being built to the plant of the J. Elwood Lee Co., manufacturers of absorbent cotton, etc.

—Pennsylvania, Philadelphia. Thomas Henry & Sons, cotton manufacturers and proprietors of the Tioga Mills, are having plans prepared for a mill building to be erected at Tioga and Collins Sts. The building will be of brick, two stories high 40 by 130 feet.

—*Quebec, Valleyfield. The new mill of the Montreal Cotton Co., at this place, is nearly ready for machinery. The main building is 150 ft. square, five stories high, with an "L" of five stories, 180 by 80. It is expected that the machinery will all be placed by December, and that the mill will start February, next year. The Montreal Cotton Co. are also building a warehouse, 220 by 80 ft., four stories high, and capable of storing 10,000 bales of raw cotton.

—Rhode Island, Albion. The Albion Cotton Co., has recently put in 33 revolving flat cards, a new drawing and some of the Woonsocket Machine Co.'s speeders and slubbers, likewise 80 new Northrop looms.

—Rhode Island, Centreville. We are informed that the Centreville Cotton Mill is soon to be remodelled. The old machinery will be replaced with more modern and up-to-date equipment.

—*South Carolina, Clover. The stockholders of the Clover Cotton Mills Co. have endorsed a proposition to add $50,000 to the present capital stock of the company and to raise $75,000 additional by subscription, making a total of $125,000, which it is said will be used for the purpose of erecting a new yarn mill. Further details of this will be published at a later date.

—*South Carolina, Columbia. Contract has been awarded by the Granby Cotton Mills Co. for the large addition to be made to their mill property here. This matter was fully reported in our issues of August and September.

—South Carolina, Edgefield. It is stated that 2500 additional spindles will be placed in the mill of the Edgefield Manufacturing Co.

—South Carolina, Laurens. The Laurens Cotton Mills have placed dobby heads on 100 looms for the purpose of making fancy weaves, and if they prove satisfactory, will similarly equip another hundred very soon. They may add other machinery.

—*South Carolina, Reedy River Factory. W. E. Beattie, president of the Reedy River Mfg. Co., writes us that it is the intention of the company to expend from $25,000 to $30,000 in new machinery to take the place of some that is a little out of date. At the present time their equipment consists of 10,000 spindles and 285 looms.

Mills Starting Up.

—*Arkansas, Little Rock. The Thomas Cotton Mill, which we reported last spring was to be erected at this place, has commenced operations, and is now producing commercial wrapping twine, clothes lines, carpet warps, etc. The plant has 3,000 spindles.

—New Jersey, Gloucester City. The Gloucester Mfg. Co.'s mill has started up after a shutdown of several weeks.

—New York, Stuyvesant Falls. The Van Alen Cotton Mills have started up again after an idleness of several months.

—*North Carolina, Norwood. The plant of the new mill has been started up for the purpose of testing the machinery, and it is expected that it will be running full very soon.

—*North Carolina, Rutherfordton. The machinery is being installed in the Rutherfordton Cotton Mills, recently purchased by Myer Levi and associates, and it is expected that the plant will soon be in full operation.

—*North Carolina, Waxhaw. The Rodman-Heath Mfg. Co. have completed the equipment of their plant, and are now operating the machinery on yarns.

—*South Carolina, Graniteville. The Warren Mfg. Co., are placing their operating machinery in position and it is expected will soon start up with about 10,000 spindles. E. F. Verdery is president and treasurer and W. W. Simons, Jr., secretary. They will manufacture print cloths.

—*Tennessee, Bristol. It is understood that the sale of the Bristol Cotton Mills to J. M. Fulton of Mount Airy, N. C., has been confirmed by the courts and Mr. Fulton will probably put the mills in operation very soon and will add some new machinery.

—*Virginia, Petersburg. John C. Maloney, one of the new company of Carolina mill men who have purchased the Swift Creek Cotton Mills, expects to start up the mills very shortly. It is stated that the price paid to August Wright and Charles Leonard for this property was $12,000.

Mills Shutting Down.

—Connecticut, Glasgow. The Glasgow Yarn Mills have been shut down for a week for the purpose of making repairs to the machinery.

—Connecticut, Putnam. The Morse Mfg. Co. have shut down their cotton mills at this place, for an indefinite period.

—Missouri, Carthage. The Carthage Woolen Mills have shut down for the purpose of making necessary repairs.

—Rhode Island, East Greenwich. The Phenix Woolen Mills have shut down.

—Rhode Island, Fiskville. The Jackson Cotton Mill has been shut down indefinitely.

Woolen.

New Mills.

—Maine, Dexter. A new coropration has been organized here which will own and run the Brick mill of the former Dexter Woolen Co. It is named the Union Mfg. Co., and is capitalized at $1500. The officers are C. M. Sawyer, president; W. H. Carr, vice-president; W. H. Judkins, secretary and treasurer; and Messrs. Sawyer, Carr, Judkins, W. E. Brewster and A. A. Springal, directors. This disposes of the last idle mill property of the old Dexter Woolen Co.

—Massachusetts, Millbury. H. L. Bowden of 18 High St., Boston, has organized a company under the name of the Bowden Felting Mills Co., and has purchased a factory at Millbury, for the purpose of manufacturing felts. He expects to start in on the production of goods about Dec. 15th. There will be a dye house.

—*Massachusetts, North Adams. R. E. Schouler, who has been superintendent of the Blackinton Mills for many years, has taken possession of a building here where he will start in the manufacture of fancy worsteds, as we reported in our issue of Sept. 2nd. Mr. Schouler expects to be in running order by Jan. 1st, 1899.

—*New Jersey, Camden. Benjamin F. Boyer & Sons, worsted yarn manufacturers, report that their new mill will soon be in operation. They will operate exclusively on French system worsted yarns. The building, which we reported in the early spring, is 60 by 100 feet, and is located on Delaware Ave. and Cooper St.

—*New York, Niagara Falls. Preparations are being made for the erection of the plant of the Alexander Morton Carpet Co., of Glasgow, Scotland. This is the company we mentioned last spring as having purchased land from the Niagara Falls Power Co., and they will also obtain their power from the same company.

—*Oregon, Dallas. The Woolen Mill which we reported Oct. 28th as being leased or practically sold to the Pioneer Woolen Mills Co., Tacoma, Washington, is reported as making many improvements to the plant. It is said that a new iron and brick picking room has been built, and an electric light plant will be put in later. It is also stated that a large manufacturing establishment for making wearing apparel will be built in connection with the mill.

—Pennsylvania, Albion. We are informed that G. W. Wilcox, of Connecticut, is considering the opening of an extensive woolen mill at this place, which will be capitalized at about $20,000.

—*Pennsylvania, Brookville. Further particulars are at hand regarding the woolen mill which is to be erected at this place by Levi Heidrick and George W. Sykes. $35,000 is being invested in the plant to commence with, but plans are being drawn to permit the immediate enlargement of the machinery to 50 per cent. more than the first capacity, if the enterprise proves successful. 60 hands will be employed at the start. Product will be ordinary flannel and a finer grade of goods, such as cassimeres, and probably worsteds. Mr. Sykes is connected with the Reynoldsville Woolen Co., and he states that they will probably enlarge to about the same capacity as the Brookville Mill.

—*Pennsylvania, Philadelphia. Messrs. Sykes Bros., manufacturers of carpet yarns, Hancock & Huntingdon Sts., inform us that their new mill will be six stories high, 50 by 100 ft.

—*Pennsylvania, Troy. The Northern Woolen Manufacturing Co., formerly C. J. Marble & Sons of Coudersport, who are now building a new mill at this place, expect to have it ready about the 15th of February. They will manufacture blankets and yarns and also ready made clothing. They want some experienced blanket weavers, also cloak and vest makers and an expert cutter.

Enlargements and Improvements.

—California, Stockton. The Stockton Woolen Mills have placed new machinery for the purpose of changing their product from woolen blankets to the making of cashmeres.

—Connecticut, Baltic. Michael H. Donahoe has completed an addition to the Shetucket Mills.

—*Illinois, Chicago. The Armour Felt Works, which we reported were established in August, have been so successful in their operations that they have been compelled to double their capacity and new machinery is being installed as rapidly as possible. H. P. Darlington is manager.

—Maine, East Madison. It is stated that considerable machinery is being added to the plant of the Lakeside Worsted Mill.

—Massachusetts, Blackstone. An addition is being built to the No. 1 mill of the Blackstone Woolen Mills, Charles Fletcher, proprietor. The buildings will be equipped with new machinery for making piece dyed fabrics.

—*Massachusetts, Cherry Valley. The additions to the Chapel Mills Manufacturing Co. are nearly completed and it is expected that work will be commenced there very soon.

—*Massachusetts, North Billerica. Talbot Woolen Mills inform us that a new boiler house will be built in addition to the other enlargements we mentioned last week.

—*Michigan, Eaton Rapids. Messrs. Harner Bros., proprietors of the Eaton Rapids Woolen Mills, report that they expect to commence manufacture of goods in their new structure about Jan 1st, 1899. Product will be fine woolen and merino knitting yarns, also weaving yarns. They will put in two new sets of woolen cards, giving them four sets in total; steam and water power.

—*New Jersey, Camden. The addition which we reported was being built to the Highland Worsted Mills, Ninth and State Sts., is finished, and the company is now installing machinery therein.

—New Jersey, Camden. The Fries-Breslin Co., Atlantic Ave. and Ferry Road, are building extensive additions to their plant. A building 100 by 50 feet, four stories high, is being rented, wherein will be installed looms and other machinery. A new dye house is also being erected, 130 by 50 feet. This will cause an enlargement of their capacity 25 per cent.

—New Jersey, Passaic. A new dye house, 100 by 194 feet, and an annex, 100 by 94 feet, have recently been added to the plant of the Botany Worsted Mill.

—*New York, Fulton. The new building which is being built for the Fulton Worsted Mills, for the purpose of giving more room for the present plant, is almost completed.

—New York, Newburg. An additional story is to be placed on one of the stone buildings of the Newburg Woolen Mills, Foster & Taylor, proprietors. The contract has been given out. The building is 70 by 132 feet, and the addition will be of stone.

—*New York, Newburgh. The Hudson River Woolen Mills inform us that their addition, which we reported Nov. 11th, will be used to increase their spinning and beaming facilities.

—Pennsylvania, Clifton Heights. A four-story addition is being built to the mills of the Thomas Kent Mfg. Co.

—Pennsylvania, Philadelphia. Thomas J. Hatfield & Co., manufacturers of cotton and woolen goods, who have been located in the Sciota Mills, Manayunk, intend removing, the middle of next month, to the Ripka Mills. It is probable that the plant will be increased from 64 looms, the present number, to 100 looms.

—Pennsylvania, Philadelphia. J. R. Keim & Co., proprietors of the Shaxamaxon Worsted Co., 515 Market St., are building a new mill at Second and Palethorpe Sts., which is nearly completed, and it is expected that it will be ready for occupancy by Jan. 1st.

—Pennsylvania, Reynoldsville. It is stated that the Reynoldsville Woolen Co. intend enlarging their plant. The product is flannels, yarns and skirts. The present plant consists of two sets, 24 looms, steam and dye.

—*Pennsylvania, Spring City. The new dye house which it being erected for Urner & Co., is almost completed. We gave full details of this project in our issue of Oct. 28th.

—*Virginia, Buena Vista. A stock company has been organized with a capital of $75,000 for the purpose of continuing the operation of the Buena Vista cassimere mills, which were lately purchased by Charles Kent. Mr. Kent will be president of the new company, and Ambrose Timberlake will be vice-president and genenral manager, with David Miller as secretary. It is stated that the new company will enlarge the plant and erect new buildings for the purpose of putting in additional machinery.

Mills Starting Up.

—Delaware, New Castle. The Knowles Woolen Mills, which have been shut down recently, have resumed work, and it is expected will continue running in full until Jan. 1st.

—*Illinois, Springfield. The Springfield Woolen Mills have resumed work, having made the repairs rendered necessary by the recent fire.

—*Maine, Guilford. The Piscataquis Woolen Mills have started up again.

—*Maine, Phillips. The Phillips Woolen Co., of which we gave full details in our issue of Oct. 1st, is now ready to start in operation.

—Maine, Rumford Falls. It is reported that the woolen mill, which has been closed since the early spring, will soon be started up again. Howard Corning, of Portland, will take charge of the mill and start it up on the manufacture of felts.

—Maine, Skowhegan. The Coburn Woolen Mill has started up again after a short shutdown.

—Maryland, Bank. The lower mill at this place, property of the Elk Mills Co., which has been unoccupied since the removal of the Gambrill Mfg. Co. to Havre de Grace, will soon be re-opened, and it is aid that 60 looms will be operated.

Scott Delbert, Alfred Kershaw and Jacob Wilson, all of Elkton, are the interested parties.

—*Massachusetts, Dalton. We are informed that the Hampden Woolen Co., which we reported Oct. 28th had shut down, is about to resume operations.

—Massachusetts, Holliston. The Holliston Yarn Mill has resumed operations after a short shutdown.

—*Massachusetts, Huntington. There is prospect of a resumption of business at the Highland Woolen Mills. F. C. Paterson, formerly superintendent, has formed a company to operate the mill.

—*Massachusetts, Lawrence. The new worsted combing plant of the Butler Worsted Co. is now completed, and will soon start up. This plant was built by Frederick Butler and leased to his sons, Franklin and Marcus. The main building is of brick, three stories high, 120 by 50 ft., with a boiler and wheel house attached. It has 4 combs and cards.

—*Massachusetts, Leicester. The additions to the Chapel Mills Mfg. Co.'s plant have been completed and the mills have started up on full time. Cheviots will be the principal product of these mills. The mills were purchased by Channing Smith, formerly treasurer, a few months ago, and he has enlarged the plant, making it a four-set mill instead of a two-set, as formerly.

—Massachusetts, Pittsfield. The Pittsfield Mfg. Co., whose plant has been idle for about a year, intends to resume operations this month.

—Massachusetts, Uxbridge. The Hecla Woolen Mill has resumed operations after a shutdown of several weeks.

—Massachusetts, West Millbury. The weave room at the mill of Edwin Hoyle & Son has resumed operations with additional help.

—New Hampshire, Goffs Falls. The Devonshire Woolen Mills have started up after a two weeks shut down.

—*New York, Amsterdam. J. T. Hepworth, general manager of the Amsterdam Woolen Mills, reports that he expects to have it in full operation by March 1st, 1899, when they will manufacture high grades of woolen goods for men's wear. A considerable amount of the machinery necessary has been purchased in England.

—New York, Utica. The Globe Woolen Mill, which has for a considerable while been running on short hours, is now working on full time.

—New York, Waterloo. The Waterloo Woolen Mfg. Co.'s mill has started up again after a shutdown of four weeks.

—*North Carolina, Albermarle. It is said that the Wiscassett Mill is almost completed and will start operation very soon.

—New Hampshire, Dover. The Sawyer Woolen Mills have resumed operations.

—Pennsylvania, Chester. The Hitchen Mfg. Co.'s mills have started up again. There has been some change made in the class of goods manufactured, and some new machinery is on the way from England. It is expected that as soon as this machinery is installed, the plant will run steadily.

—Pennsylvania, Clifton Heights. The Clifton Worsted Mill, Albert R. Elsasser, proprietor, has resumed operations, after an eight weeks' shutdown.

—*Rhode Island, Mapleville. William Legg informs us that he expects to start up the Mapleville Mill shortly. James McAnanny and Frank W. McAnanny are interested with him in the project. The machinery is being overhauled.

—Vermont, Hartford. The Hartford Woolen Co.'s mill has started up and is now working on full time.

—Virginia, Snowville. We are informed that there is a likelihood of the Snowville Mills being started up to make shoddy and cotton goods. O. G. Slenker, proprietor of the mill, will furnish the mill and water power, together with what wool he has on hand. Mr. Newby, of Dresden, Ohio, will furnish three sets of cards, two broad looms and other machinery. These mills have been engaged in the manufacture of blankets, jeans, cassimeres, flannels, lindseys and yarns.

Mills Shutting Down.

—Illinois, Warsaw. We are informed that the Knox-Hill Co., proprietors of the woolen mill at this place, have shut down for an indefinite period.

—Iowa, West Point. The West Point Woolen Mfg. Co. has shut down. This mill does not run in the winter. James H. Hendry, general manager and superintendent, is returning to his home in Utica, where he will spend the winter.

—Maine, North Berwick. The North Berwick Woolen Co.'s mill has shut down for an indefinite period.

—Maine, Sabattus. The lower mill of the Webster Woolen Co. has closed down for an indefinite period.

—*Maine, Turner. F. D. Faulkner's woolen mill has shut down indefinitely, throwing 40 hands out of employment.

—Massachusetts, Adams. It is reported that the Windsor Falls, Mfg. Co.'s mill has shut down for an indefinite period.

—Massachusetts, Lowell. It is reported that the Merrimack Woolen Mills, which have been running on short time since last spring, will probably close down for an indefinite period very soon.

—New Hampshire, Union. A. L. Taft's woolen mill has shut down for an indefinite period.

—Ontario, Almonte. Boyd, Caldwell & Co.'s Woolen Mill has closed for repairs.

—Tennessee, Silvicola. The business of the Reedy Creek Woolen Mills Co. has been finally wound up. These mills have been idle for a considerable while.

Knit.

New Mills.

—*Georgia, Barnesville. The new underwear mill which is being built by the Hanson-Crawley Co., is nearly completed. Full particulars of this mill were given in our issue of August 19.

—*Georgia, Cedartown. Macinery for manufacture of underwear is being installed in the mill at this place, known as the Wanita Knitting and Hosiery Mill.

—*Georgia, Cedartown. G. W Featherston, whom we reported as about to start a knitting mill, informs us that it is not as yet a certainty, but that he would be glad to have estimates from builders of knitting machines for the manufacture of ladies' and men's underwear, together with auxiliary machinery, shafting, belting, etc. He has good power, and states that if the prices and general outlook are satisfactory, he will be more than apt to build a mill. What he would like to get is an estimate on a complete organized plant, rather than the prices of individual machines.

—Georgia, Molena. James Brooks has commenced work on the erection of a small knitting mill here.

—Illinois, Aurora. It is said that J. C. Ruth, who at one time was engaged in the manufacture of suspenders, has established a factory at this place for the purpose of making silk underwear.

—*New York, Phoenix Mills. The Index Knitting Mills which recently purchased the Hope Factory near Cooperstown expects to commence spinning yarn about Feb. 1st, 1899, and when the summer comes will manufacture underwear. The plant will consist of 1120 spindles, 15 knitting machines and four sets of cards; water power. It will be known as mill No. 2 of the Index Knitting Mills. John P. Doane is the superintendent.

—Ohio, Elyria. The Fay Stocking Co. has been incorporated here with a capital stock of $50,000. W. L. Fay is president and manager, Henry Wurst, vice-president; R. T. Reefy, secretary; and R. W. Hill, treasurer. The company will erect a new building, and will install machinery for the purpose of making a special kind of goods. They desire to receive estimates on knitting and finishing machinery, also equipment for a dye-house.

—*Pennsylvania, New Cumberland. The new knitting mill which we reported Oct. 1st had been formed by James Morley, Julius Kauffman and Joseph Boughman has been started up with a small force of hands, which will probably be enlarged later on.

—Pennsylvania, Schuylkill Haven. We learn that William Sausser intends starting a knitting mill in the building lately occupied by the Eureka Knitting Mill. Schumacher & Keller, proprietors.

—Vermont, Bennington. It is reported that a knitting plant will be placed in the old Aldine Mill here. It is not as yet known who are interested in this project. The Aldine Mill has been closed for a number of years.

Enlargements and Improvements.

—*Connecticut, Winsted. The addition which we reported last week would be built to the Winsted Hosiery Co.'s plant will contain 20 new knitting machine, which will bring the total number of knitting machines up to 145. The company expect to have the addition completed and in full running order by Jan. 1st, 1899.

—*Georgia, Stone Mountain. The knitting department, which we reported earlier in the year, the Amestown Cotton Mills contemplated adding to their plant, has been completed, and is now running with a daily capacity of 100 dozen pairs of men's hose.

—Massachusetts, Highlandville. A one-story addition is being built to W. Carter & Co.'s knitting mill at this place.

—*Massachusetts, Northampton. Contract has been given for building the foundation of the new hosiery mill for the McCallum Hosiery Co.

—Massachusetts, Ware. An addition is being built to the underwear finishing department of the Otis Company at this place.

—*New York, Cohoes. The F. W. Kavanaugh Co., which has lately reported been incorporated with a capital of $100,000, to succeed F. W. Kavanaugh & Co., inform us that they are building an addition, which they expect will be in complete running order by Jan. 1st, 1899. They manufacture men's, ladies' and children's cotton and woolen mixed goods, and men's, ladies' and children's fleece lined goods in both cotton and wool back effects, together with men's and children's balbriggan underwear. 20 new knitting machines have been installed, which will bring their total up to 50, and 1440 cotton spindles.

—New York, Cohoes. The Victor Knitting Mills Company are considering the construction of a two story building between the new Nos. one and two mills, which are at present being built. It will be fire proof, and will be built entirely of brick and iron, and will be used for the pickers and lappers. It is also stated that a portion of the brick work on the North side of the No. 3 mill will be rebuilt.

—New York, Mechanicville. An addition is being built to the plant of the Mechanicville Knitting Co., 20 by 75 ft., in which, when completed, new machinery will be installed.

—*New York, Utica. The Utica Knitting Co. inform us that the increase in their capital stock, which we reported last week, will be used for the purpose of doubling their present plant, which consists of 48 knitting machines and eight sets of cards.

—*North Carolina, Charlotte. The Gold Crown Hosiery Knitting Co. confirms our report that they are about to add a yarn spinning plant to the mill. They will manufacture cotton hosiery yarn on cones, 18's to 24's, and will put in 2,000 new spindles and will also add four knitting machines giving them a total of 114 machines. Production will begin about Jan. 1st, 1899. The new equipment has been ordered.

—*North Carolina, Raleigh. The Willard Mfg. Co., of Willardville, N. C., which we reported recently would remove its plant to this place, will expend some $6,000 for the enlargement of the plant. The company will increase its equipment by 25 knitting machines and a 25 h. p. engine. The product will be full and half hose. Their new shop is at 628 Hillsboro St.

—Pennsylvania, Mohn's Store. An addition is being erected to the hosiery mill of Leininger & Co.

—Pennsylvania, Norristown. Rambo & Regar, owners of the Globe Knitting Mills, are building a dye house at their new mills at this place.

—*Pennsylvania, Pottstown. Wisner, Heistand, Booth & Co., manufacturers of seamless hosiery, who removed from Parkerford to this place, have started up their new hosiery mill with 14 machines and about 20 hands, which will be increased in the near future to 50 machines and over 50 hands. The new building is 30 by 50 feet, three stories high and built of brick; steam power.

—Pennsylvania, Reading. The Reading Knitting Mills are adding 160 addition automatic knitting machines, which will increase the daily output of the mill from 1200 to 1800 dozen hose.

—Pennsylvania, Reading. The Pennsylvania Knitting Mills, which have been located at 506 Kerper St., have taken posession of the three-story factory building at Eighth and Oley Sts., their former quarters having become too small for their volume of business.

—Rhode Island, Woonsocket. Frank J. Prue & Co., who have hitherto been manufacturers of worsted yarn mittens, have just started to change their production to underwear, and will operate eleven knitting machines and eight sewing machines.

Mills Starting Up.

—*Indiana, Fort Wayne. The United Knitting Mills have now started work on children's hose. We gave full details in regard to this mill, which is a branch of the Wayne Knitting Mills, in our issue of Sept. 23rd.

—*New Hampshire, Franklin Falls. It is said that the Aiken Hosiery Mill, which we reported Oct. 7th had shut down for the purpose of making repairs, will start at least part of their machinery on or about December 1st.

—New Hampshire, Laconia. J. W. Busiel & Co.'s hosiery mill, which has been closed for a considerable while, has started up for the purpose of making samples, and it is probable may continue in operation throughout the winter.

—New York, Cohoes. There is a rumor to the effect that Charles McCarthy, of Troy, N. Y., proprietor of the American Knitting Mills, intends placing the plant in operation very soon.

—*Vermont, Bennington. The Bradford Mill, which has been practically rebuilt, is almost completed, and it is hoped to have the mill in full running order during the next two weeks.

Silk.

New Mills.

—Connecticut, Norwich. There seems to be every reasonable prospect of the J. B. Martin Company, Lyons, France, locating a branch of their business in this town. This firm has been considering the advantages of many towns, all of which have been very sanguine about obtaining the business. The town proposes to remit the taxes of, and exempt the company from taxation for a period of ten years, and to appropriate a sum of money not exceeding $1,000, necessary to purchase a building site to be given to the company. The Martin Company is willing to use considerable of its own money in putting up the plant. All it asks is to have the land presented, to lease suitable buildings and receive concessions concerning taxes.

—New Jersey, New Orange. A new mill is being built at this place in which S. J. Wylie and William Solomon, of the Hope Valley Silk Mfg. Co., Wyoming, R. I. are interested. It will be two stories high, 175 by 42 ft., and will be used for the purpose of making all-silk goods. It will be a 200 loom plant, and it is expected will be in operation by Dec. 1st. Office and salesroom, 640 Broadway, New York.

—*New Jersey, Paterson. The brick work on the addition to the Sterling Silk Co's plant is reported as practically completed.

—New York, Cohoes. The Tivoli Mills, owned by the Root Mfg. Co., have started up in full after a long period of work on three-quarter time.

—Pennsylvania, Allentown. Nagle & Sons are reported as contemplating the erection of a new silk mill at this place, which will employ about 200 hands.

—*Pennsylvania, Coatesville. Machinery is now being installed in Ashley & Bailey's new silk mill at this place, and it is expected that it will be in operation by Jan. 1, 1899.

—*Pennsylvania, Lock Haven. Work on the foundation of the new Lock Haven Silk Mill is being pushed forward as rapidly as possible. We gave full particulars of this project in our issue of Oct. 14th.

—*Pennsylvania, Parsons. The Parsons Silk Throwing Co.'s new mill is rapidly getting into working order and machinery is being installed. It is expected that production will be started very soon.

—Pennsylvania, Shamokin. A silk throwing establishment has been organized here with a capital of $15,000, $12,000 of which is already subscribed. It is expected that the plant will be in operation within 30 days. It will occupy the first floor of the new silk mill and about 70 hands will be employed at the start. It is incorporated under the name of the Shamokin Silk Mill Co. John Mullen has been appointed treasurer. The following board of directors has been chosen: Hon. C. R. Savidge, Hon. R. R. Kulp, Col. W. C. McConnel, C. O. Leader, John Mullen, W. W. Ryon, D. D. Heim, and W. E. Snyder.

*Rhode Island, Wyoming. We are informed by the Hope Valley Silk Mfg. Co., that they expect to start production of their goods Nov. 15th. 50 new looms are being installed, and they hope to add 150 later on. They will manufacture silk goods for cloak and suit trade, and tailors' satins. S. J. Wylie and William Solomon are the interested persons. Office and salesroom, 640 Broadway, New York.

Enlargements and Improvements.

—Connecticut, Mystic. It is reported that the Rossie Velvet Co. will make another enlargement in the near future.

—Connecticut, Seymour. A small addition is being built to the printing room of the plush mill of the Tingue Mfg. Co.

—New Jersey, Paterson. An extension is being built to the Sterling Silk Mill, the corner stone of which was laid last week. Full details of this addition will be published at a later date.

—*New York, Elmira. It has now been definitely settled that J. N. Stearns & Co., will remove their silk manufacturing plant from New York to Elmira, and a mill will be built upon a tract of land donated free of cost by this city. We have previously reported this projected removal under the head of New York City.

—New York, Sidney. The Clark Fabric Co. has found it necessary to enlarge their plant. The silk mill is having an addition built 25 by 30 feet, two stories

high, and another addition is being erected at the novelty works, 60 by 100 feet.

—New York, West New Brighton. The Empire State Woven Label Co.'s plant has recently been enlarged, a number of new looms installed and other machinery of the latest improved design added to the equipment. The plant now consists of 18 double looms with a capacity of about 100,000 woven labels per week. The main building is 40 by 60 feet, three stories high. A. H. Buhl is proprietor.

Miscellaneous.

New Mills.

—Massachusetts, Boston. An organization known as the New England Dyeing & Finishing Co. has purchased a two story factory building on Codman St., Dorchester, and will occupy the premises at once.

—Missouri, St. Louis. The American Mfg. Co., manufacturers of jute bagging, have received a permit to erect a four story bagging factory between Chouteau and Hickory Sts., in this city, at a cost of $4,700. They are at present in the Rialto Building, where they operate 71 looms.

Enlargements and Improvements.

—Connecticut, New Haven. The Forsyth Dyeing, Laundering & Bleaching Co. are very busy at present and have been for a long time. They are so rushed with work that they are considering the question of an enlargement, although nothing definite has yet been decided.

—New Jersey, Rockaway. The Lion-dale Bleaching, Dyeing & Print Works are adding largely to their machinery equipment, including a new printing machine.

—Pennsylvania, Philadelphia. The Franklinville Dye Works will carry out their plans of building an addition to their plant, as previously reported, and will also repair the damage caused by the recent fire. Contracts have been let.

Mills Starting Up.

—Massachusetts, Milbury. Whitney, McDuff & Co.'s thread mill, which has been shut down for a short time, has started up again with the regular force of hands.

—Massachusetts, Williamstown. The Boston Finishing Works have resumed operations after a short shutdown for the purpose of making repairs to the plant.

Fires.

—Connecticut, New Britain. A fire broke out in the factory of the New Britain Knitting Co. recently, causing damage to the amount of $1,000.

—Illinois, Springfield. A fire occurred at the Springfield Woolen Mills recently causing a loss of over $1,000. The mill shut down for a week for the purpose of making the necessary repairs.

—Massachusetts, East Brookfield. The picker house of the Mann & Stevens Woolen Co. was destroyed by fire recently, together with its contents. The shoddy mill plant is owned by the Quaboag Mfg. Co., and was leased by the Mann & Stevens Woolen Co. The picker house was two stories high, 42 by 42 feet, and contained three picker machines, a quantity of oil and some 5,000 pounds of shoddy. The estimated loss on the machinery, stock and building is $2,600. A new picker house will be built at once.

—Rhode Island, Pascoag. The Pascoag Woolen Mill, Wiseman & Dunn, proprietors, was destroyed by fire Oct. 31st. The loss is estimated at $40,000. The plant consisted of a large wooden building, 120 by 40 ft., a picker house, dye house and boiler house, all of which were burned.

Failures and Suspensions.

—Massachusetts, Millbury. The copartners of the firm of John H. Mason & Sons have field three separate petitions in bankruptcy. Total firm liabilities are $810,000, with assets of $289,000. Individual liabilities of Eugene W. Mason, $335,890; individual assets of the same, $102,600. Individual liabilities of John H. Mason, $180,250.02; individual assets of the same, $109,520.67; making the total liabilities $1,326,000, and the total assets $509,000.

—Massachusetts, Plymouth. The creditors of the Plymouth Woolen Co. met recently to consider what should be done in the matter of their recent failure, and Messrs. Ripley, Curtis & Crosby were appointed a committee to investigate and report on the assets, and to recommend some plan of action in regard to the matter. It is said that an extension of time will be asked for and granted to enable a satisfactory settlement of all claims. Liabilities are now estimated at $750,000. A proposition has been made to receive the notes of Sawyer and Douglas for 50 per cent. of the indebtedness, to run three years, and notes of a new corporation for the remaining 50 per cent., the new company to take the assets in trust and give in equal amounts one-year and two-year 5 per cent. notes.

—New Hampshire, Dover. A return has been made by Jeremiah Williams and A. W. Sulloway, assignees of the Sawyer Woolen Mills, to the effect that the total liabilities of this company are $995,709.30, with assets of $626,161.60. In the assets, the assignees have not included some $75,000 due from the Somersworth Machine Co., and about $45,000 due from the Dover Clothing Co., both of which firms have assigned, and from each of which some dividend will be received. $300,000 of receivables, due from F. A. and J. Sawyer have likewise not been included, and there is also the real estate and machinery of the mill, which includes not only the mill itself but some tenement houses in addition, all of which stand on the books of the mill as being worth $575,163.61. A committee has been chosen to confer with the assignees, comprising M. T. Stevens, C. W. Jones and A. P. Loring.

—New Jersey, Paterson. Frank Van Cleve, receiver of the Knickerbocker Silk Co., has wound up the affairs of the company. Liabilities are $19,639.72. The creditors will have the sum of $4324 to divide, less fees and costs.

—New York, New York City. Abraham Ober and Albert Radlauer, partners in the firm of Ober & Radbauer, have filed a petition in bankruptcy with liabilities at $4,800, and no assets. They were formerly manufacturers of sweaters at 42 Franklin St., under the name of the

Gotham Knitting Mills, which concern failed in June last.

—New York, New York City. James and Allan Macnaughton have severally filed petitions in bankruptcy with heavy liabilities and small assets. The liabilities of James Macnaughton amount to $1,129,530, and his nominal assets are $347,921. The liabilities of Allan Macnaughton are substantially the same as his brother, and his assets consist of a two-fifths' interest in the various securities pledged for loans, claims against the Merchants' Safe Deposit Company and the Wool Exchange for salary, together with a small deposit in the Tradesmen's Bank. The liabilities of both are nearly all for various sums of money advanced on notes and each of the brothers is liable for the whole indebtedness, being either maker or endorser on the notes. The bulk of the debts are secured by pledges of various stocks which are put in the assets. While they are liable for the whole debt to outsiders, as between themselves James is liable for three-fifths and Allan for two-fifths.

Facts and Gossip.

—Connecticut, Winsted. The capital stock of the New England Knitting Co. has been increased from $50,000 to $100,000. This increase has been fully paid from actual surplus earnings of the corporation.

—*Delaware, Wilmington. George S. Capelle has been appointed receiver of the Arlington Mills Mfg. Co. Whether the receiver will operate the plant is not known, but it is not considered probable that it will be operated for some time.

—Frorida, Jacksonville. The American Fibre Co., are reported as desirous of receiving prices on cotton batting machinery.

—Illinois, Chicago. The Union Feather & Wool Manufacturing Co. has been incorporated here with a capital stock of $10,000, and the following as incorporators: Joseph V. Crane, G. Langhenry and John Stelk.

—Iowa, Des Moines. Articles of incorporation have been filed changing the name of the Des Moines Mills to the Des Moines Hosiery Mills.

—Kentucky, Mayfield. The Mayfield Woolen Mill Company are about to engage in the manufacture of pants, from the product of their own looms. Many improvements have recently been made in their plant, and more are said to be contemplated in the near future.

—Maine, Dover. The woolen mill of the Brown Mfg. Co. is running four days a week.

—Maine, Foxcroft. Mayo & Sons mill is running but four days a week at present, and will probably continue on that schedule for some time.

—Maine, Madison. The Indian Spring Woolen Mill Co. have stopped their night work. A large addition is being built to the storehouse.

—Maine, Wilton. The Wilton Woolen Mills, F. J. Goodspeed, proprietor, have stopped running nights, throwing 50 hands out of employment.

—*Massachusetts, Clinton. The Clinton Worsted Co. have closed their lower mill, and are now at work removing the plant to the upper mill.

—*Massachusetts, Fall River. The stockholders of the Laurel Lake Mills have voted to cut down the capital stock from $500,000 to $200,00, and to raise it again to $400,000. This will cause the recapitalization of the mills on a basis of $7 a spindle. The stockholders will have until Jan. 1st to subscribe for the stock untaken, after which the remainder, if any, will be sold at public auction. A new board of officers has been chosen, as follows: Clerk and treasurer, Edward L. Anthony; directors, John P. Slade, Leonard N. Slade, M. G. B. Swift, Dr. S. W. Bowen, Joseph A. Bowen, Edward L. Anthony, and John B. Huard.

—*Massachusetts, Farnumsville. The Farnumsville Cotton Mills, which we reported last week had shut down again, have not yet started up, and the impression seems to be that they will remain closed until after the new year.

—Massachusetts, Lowell. The seamless pocket department of the Whittier Cotton Mills has shut down indefinitely.

—Massachusetts, Mendon. The mill of George R. Whiting, manufacturer of shoddy and extracts, which was burned last August, has been rebuilt. The capacity has been increased, and a new addition has been built to the picker house.

—*Massachusetts, North Oxford. Michael Degnan, proprietor of the Oxford Dye Works, states that he is simply introducing finishing machinery in his establishment for the purpose of finishing fabrics for other concerns, and will not put in looms as reported.

—Massachusetts, North Oxford. The Thayer Woolen Co., which operates a mill here and in Dayville, Conn., announce their intention of running their mills only half time after Dec. 1st.

—*Massachusetts, Oakdale. A report has been current that the West Boylston Mfg. Co. may go out of business, when their property is taken by the Metropolitan Water Board. We are informed by the treasurer that this has little or no foundation; in fact, the officers have been investigating various sites for more than a year, and they have added new machinery to the plant at Oakdale and have never taken any formal action whatever in reference to the future of the company. The factory is running as fully as possible, and there is no thought whatever of stopping, but what its future will be is yet an unsolved problem.

—*Massachusetts, Pittsfield. There has been some delay in the arrival of the machinery for the Pomeroy Mill, which has been leased by Helliwell & Co., of Leeds, Eng., and it is probable that they will not be able to start for at least a month yet.

—*Massachusetts, Smithville. There seems to be no prospect of resumption of work at the cotton mill of J. Edwin Smith, and many of the operatives are leaving the town.

—Massachusetts, South Gardner. It is reported that parties from New York have been here with a view to purchasing the pail factory of J. H. Sibley and converting it into a shoddy mill.

—Massachusetts, Worcester. The Cleveland Machine Co. have filed a voluntary petition in bankruptcy. The secured claims amount to $18,000, and unsecured,

$10,082.01. S. W. Goddard and Anna R. Cleveland are owners.

—New Hampshire, Manchester. The Amoskeag Cotton Co. have won their case against the city of Manchester for an abatement of taxes. They have been awarded the sum of $41,357.53, and the city will, in addition, have to pay the interest of this sum and the costs in the case.

—New Jersey, Belvidere. A portion of the new silk mill being built at this place by Bamford Bros. fell down recently, the rain and high winds having weakened the structure to a considerable extent.

—New Jersey, Camden. The Fidelity International Co. has been incorporated here for the purpose of manufacturing cotton seed oil and cotton yarns. Capital stock is $2,000,000, of which $25,000 is said to have been paid in. Incorporators are Charles A. Furbush, James A. McCullough, Robert K. Reinmey and Andrew Cochran.

—New York, Amsterdam. The Van Brocklin & Stover Co. has been incorporated here for the purpose of dealing in knit goods, with a capital stock of $90,000. The directors are William H. Rowe, Jr., of Troy; William S. Van Brocklin and Martin L. Stover, of Amsterdam. It will carry on the business of Van Brocklin & Stover.

—New York, Dolgeville. It has been decided by the courts that all creditors of the late firm of Alfred Dolge & Son, who intend bringing actions for the purpose of vacating the appointment of Albert M. Mills as receiver, will have to bring such action in the courts in Herkimer County, and that actions brought in other localities will not be recognized.

—North Carolina, Charlotte. It is reported that a loom reed factory is to be established here by John Leslie and associates, who were recently connected with the Southern Card Clothing Co., of this city.

PERSONAL RECORD.

Cotton.

—B. D. Davol was recently re-elected president of the Barnard Mfg. Co., Fall River, Mass.

—James W. Cumnock, treasurer of the Manchester Mills, Manchester, N. H., has resigned.

—J. H. Creekmore, formerly with the Louise Mills, Charlotte, N. C., has charge of the carding and spinning at the Dover Mill, at that place.

—Richard Cook, formerly superintendent of the Kerr Thread Mills, Fall River, Mass., has been appointed general superintendent of about fourteen thread mills by the new American Thread Co.

—Charles Baker, formerly boss finisher at the Hamburger Cotton Co.'s mill, Columbus, Ga., has removed to Nashville, Tenn., to accept the position offered him as overseer of reeling, quilling, etc.

—Joseph A. Burke, secondhand in the Border City Mfg. Co.'s mill, Fall River, Mass., was recently married to Miss Johanna F. Casey.

—A. H. Bradly has secured the position of overseer of spinning with the Abbeville Cotton Mills, Abbeville, S. C.

—John Biggs, overseer of spinning at the Darlington Cotton Mills, Darlington, S. C., has been promoted to the position of superintendent.

—E. C. Barnhardt has resigned the superintendency of the Asheville Cotton Mills, Asheville, N. C., to accept the general superintendency of all the Cannon mills in Concord, China Grove and Albemarle, N. C.

—D. E. Byars, formerly day overseer at the Enoree Mfg. Co.'s mill, Enoree, S. C., is now night overseer of carding at the Pelham Mfg. Co.'s mill, Pelham, S. C.

—W. A. Gill, overseer of weaving for many years at the Asheville Cotton Mills, Asheville, N. C., has been promoted to the position of superintendent.

—Francis Hamilton has resigned as overseer of spinning at the Laurens Cotton Mills, Laurens, S. C., and is now overseer of spinning, spooling and warping at the Fulton Bag & Cotton Mills, Atlanta, Ga.

—C. Henry Harris, for a number of years section hand in the Methuen Co.'s mill, Methuen, Mass., has resigned.

—Frank A. Hawkins has been engaged by the Shove Mills, Fall River, Mass., as overseer of spinning. Mr. Hawkins was formerly with the Warren Mfg. Co., Warren, R. I., in a similar capacity.

—J. A. Hudson has resigned as night boss spinner at the Edna Cotton Mills, Reidsville, N. C., to accept a position in the Riverside Cotton Mills, Danville, Va.

—Alexander F. Hobbs, superintendent at the Merrimack Mfg. Co., Lowell, Mass., was married recently to Miss Louise Allen.

—John Hamer, section overseer in the weaving department of the Lancaster Mills, Clinton, Mass., has resigned.

—J. C. Finley, assistant weaving overseer at the Lockhart Cotton Mills, Lockhart, S. C., is now in a similar position with the Granby Cotton Mills at Columbia.

—William U. Farrington has been appointed superintendent of the Greenwich Bleachery, East Greenwich, R. I. He was connected with the firm a number of years ago when in different hands.

—A. C. Franklin, general overseer of carding and spinning at the Pelham

Mills, Pelham, S. C., has been promoted to assistant superintendent.

—J. R. Federline, formerly of Roanoke Rapids, N. C., has charge of the spinning in the Courtenay Mfg. Co.'s mills, Newry, S. C.

—Sidney F. Hopkins, formerly with the Derby Cotton Mills, Derby, Conn., has succeeded A. K. Wood as overseer of carding in the Valley Falls Co.'s mill, Albion, R. I.

—John R. Mason has given up the superintendency of the Laurel Lake Mills, Fall River, Mass

—John R. Morris has been elected superintendent of the Anderson Cotton Mills, Anderson, S. C., in place of William R. Roberts, lately deceased.

—Claud Montjoy, formerly secondhand at the Laurens Cotton Mills, Laurens, S. C., has been promoted to the position of overseer of spinning.

—M. L. Moore, recently in charge of the spinning, twisting and weaving at the Southside Cotton Mills, Salem, N. C., has been promoted to the position of boss carder, succeeding Calvin Moore, who has accepted the superintendency of the Efird Mill, Albermarle, N. C.

—George W. Miles, formerly with the Lancaster Mills, Clinton, Mass., has accepted the superintendency of the Bennett Spinning Co.'s mill, New Bedford, Mass.

—W. G. McLoon, formerly superintendent of the Barnaby Mfg. Co., Fall River, Mass., has been appointed superintendent of the Lancaster Mills, Clinton, Mass., to succeed W. G. Nichols, resigned.

—Thomas McVeigh is now secondhand of ring spinning with the Putman Mfg. Co., Putman, Conn.

—Andrew Shields, formerly designer for the Pemberton Co., Lawrence, Mass., has recently accepted position of assistant superintendent and designer for the Mississippi Mills at Wesson, Miss.

—Robert Stewart, formerly with the Slater Cotton Mills, Pawtucket, R. I., has been appointed superintendent of the Shove Mills, Fall River, Mass.

—John Schofield has resigned his position at the Alpha Mills at Charlotte, to accept charge of the spinning, spooling, warping and slashing at the Enoree Mfg. Co., Enoree, S. C.

—James Sparks now has a position under his brother, Charles Sparks, at the Clifton Mfg. Co.'s No. 1 mill. He recently resigned as spinning overseer at the Union Cotton Mills, Union, S. C.

—W. G. Nichols has resigned as superintendent of the Lancaster Mills, Clinton, Mass.

—Jonathan Pickles has resigned his position with the Phoenix Co. of Nashville, Tenn., and accepted another with the Henderson Cotton Mills at Henderson, Ky.

—Walter Parker, of Lowell, was recently elected a director in the Hargraves Cotton Mills, Fall River, Mass.

—W. S. Pratt, of Montville, Conn., is now with the Dwight Mfg. Co., Chicopee, Mass., as overseer of weaving.

—Supt. Page, of the Smitherman Cotton Mills, Troy, N. C., who has been suffering from an injury sustained in an accident, is back again at the mill.

—J. W. Roberts, formerly superintendent in the spinning department of the Courtenay Mfg. Co.'s mill, Newry, S. C., has resigned to accept charge of the spinning at the Anderson Cotton Mills, Anderson, S. C.

—John O'Connell has been engaged as overseer of weaving in the Valley Falls Co.'s mill, Albion, R. I., which position A. J. Blanding formerly held.

—J. S. Osteen has taken charge of the weave room of the Monroe Cotton Mills, Monroe, Ga.

—Leontine Lincoln was recently elected president of the Hargraves Mills and the Parker Mills, Fall River, Mass.

—D. H. Wallace is now dyer and chemist for the Muscogee Mfg. Co., Columbus, Ga.

—T. W. Wilmarth has entered upon his new duties as superintendent of the Galveston Cotton Mill, Galveston, Texas. Mr. Wilmarth was formerly superintendent of the Millbury Cotton Mills, Millbury, Mass.

—James H. Whitney, formerly clerk in the Merchants' National Bank, Norwich, Ct., is occupying a similar position in the office of the Norwich Bleaching, Dyeing & Printing Co.

—J. M. Templeton has succeeded M. L. Moore in charge of the spinning, twisting and weaving at the Southside Cotton Mills, Salem, N. C.

—W. P. Kelley, formerly of the Muscogee Mfg. Co.'s mill, Columbus, Ga., has been appointed overseer of weaving at the Phoenix Mills, Nashville, Tenn.

—A. Kale, of Mt. Holly, N. C., has succeeded W. J. McDonald as night superintendent of the Atherton Mills, Charlotte, N. C.

—George Keller, recently engaged in the grocery business at Charlotte, N. C., has returned to the mills business, and is now with the Ada Cotton Mills, in charge of the card room.

—C. W. Jones, of Boston, president of the New England National Bank, has been elected treasurer of the Manchester Mills, Manchester, N. H., succeeding J. W. Cumnock, resigned.

—V. M. Johnson is now boss weaver at the Lockhart Cotton Mills, Lockhart, S. C. Mr. Johnson was formerly employed in a similar capacity in the Mills Cotton Mills, Greenville, S. C.

Woolen.

—Charles Bigelow has been forced by ill health to resign as agent of the Bigelow Carpet Mills, Clinton, Mass., and has sailed for Egypt.

—J. H. Hill is now filling the position left vacant by V. M. Johnson, resigned.

of boss weaver at the Mills Cotton Mills, Greenville, S. C.

—Turner Rollinson has recently accepted a position as dyer with the Westfield Mfg. Co. at Westfield, Mass.

—R. Rotheroy, formerly of Westfield, has accepted a position as finisher with the Nonantum Worsted Co., Newton, Mass.

—Thomas S. Drury is now employed at the Devonshire Mills, Goffs Falls, N. H. He was formerly at Somersworth.

—George Dick, formerly designer in the Excelsior Woolen Mills, Montreal, Canada, has accepted a position as superintendent and designer in the Gilles Woolen Mills, Carleton Place, Ontario.

—J. J. Davis, foreman of the carding room at the Dana Warp Mill, Westbrook, Me., has resigned, and removed to his farm in Yarmouth.

—Philip Dana, a graduate of the Philadelphia Textile School, has been appointed foreman of the carding room at Dana's Warp Mill, Westbrook, Me., succeeding J. J. Davis.

—G. A. Crockett is now employed as machinist at the Caryville Mills, Careyville, Mass., Herbert Richards having resigned.

—J. Clifford Ayer is in charge of the twelve set woolen mill operated by the Mascoma Flannel Co., Lebanon, N. H.

—Albert Gurney has returned to his position as boss finisher in the Singleton Worsted Co.'s mill, Franklin, Mass.

—John Gallagher, formerly dyer at the Collinsville Mills, Collinsville, Mass., has resigned and removed to Franklin Falls, where he has obtained a similar position.

F. H. Graichen has resigned as spinner, twister and spooler at the Manton Woolen Mills, Manton, R. I., to accept a position of assistant superintendent. Mr. Graichen was with the Manton Co. for 14 years.

—M. J. Gahagan, formerly employed by Holden, Leonard & Co., Bennington, Vt., as carding overseer, has resigned and accepted a similar position with the Otrobando Woolen Co., Norwichtown, Conn.

—Dover Heneault is in charge of the dyeing at the Dunn Worsted Mill, Woonsocket, R. I., succeeding W. H. Parr, resigned.

—Joshua Heaton has succeeded George S. Lowe as overseer of spinning for Henry B. Farrell, Howard & Berks Sts., Philadelphia, Pa.

—Matthew Holloran, formerly of Otter River, Mass., is now with Holden, Leonard & Co., of Bennington, Vt., as second-hand in card room.

—John Hartley has resigned his position as dyer for the Sterling Mills, Lowell, Mass., after a service of four years.

—L. B. Hollingsworth has secured the position of carder with the Robinson Mills, South Windham, Me.

—Charles E. Fields has been employed as boss weaver by the Yount Woolen Mills Co., Yountsville, Ind.

—Walter N. Fogg has secured the position of bookkeeper with the Pondicherry Co., Bridgton, Me.

—Benjamin Eyers, formerly boss finisher at the Merchants Woolen Mills, Dedham, Mass., has taken charge of the finishing room of F. L. Sayles & Co.'s mill, Pascoag, R. I.

—Charles Eames, of Andover, Mass., has taken charge of the electric plant at the Lowell Textile School, Lowell, Mass.

—Alfred McLellan, of Watertown, has been appointed dresser tender at C. W. & A. D. Gleason's mill, Gleasondale, Mass.

—Welcome Mortimer, formerly with Edwin Hoyle & Son at their West Millbury mill, is now taking charge of the weaving for the Worcester Textile Co. at Millbury.

—Peter M. H. McEwen has resigned as overseer in finishing room of the Hampden Woolen Mills, Hampden, Mass.

—T. E. Moore, of Webster, has been engaged as boss spinner by the Thayer Woolen Co., Killingly, Conn.

—Frank McCracken, formerly in the pattern room of the French River Textile Co., Mechanicsvile, Conn., has accepted a position as designer in Putnam, Conn.

—Frank McMahon has resigned as boss carder at the Oak Valley Woolen Mill, Tarkiln, R. I.

—Otho Sawyer, formerly boss finisher at the Penobscot Woolen Mill, Dexter, Me., has accepted a position at the Morrison Brothers mill.

—Stanley W. Sharp, engineer for the Stafford Worsted Co., Stafford Springs, Conn., has severed his connection with that firm and removed to Norwich, Conn.

—John Supple has removed, with his family, to Chicago, where he has a position as boss dyer. He was formerly employed by Milner & Co., Moosup, Conn., in a similar capacity.

—W. H. Parr has resigned his position with the Dunn Worsted Mills, Woonsocket, R. I., to take charge of the dye house of the Perseverance Mill, Woonsocket, R. I.

—Arthur Pilling, of Newton, Mass., has accepted the position of boss weaver for Franklin Glazier & Son, South Glastonbury, Conn.

—Ralph Richards, bookkeeper, has severed his connection with the Stafford Worsted Co., Stafford Springs, Conn., and has removed to Woonsocket, R. I., where he has purchased a steam laundry.

—W. B. Robinson has been employed in the dyeing department of the Hamilton Woolen Co., Southbridge, Mass.

—J. J. O'Connor, boss spinner at Edwin Hoyle & Son's mill, West Millbury, Mass., has resigned.

—Sydney Little, of Rockville, Conn.,

has begun work as designer for Sayles & Jenks, Warren, Mass.

—James Levins has resigned his position as boss weaver for the Westerly Woolen Co., and secured a similar position with the Bound Brook Woolen Mills, Bound Brook, N. J.

—George S. Lowe, for the past two years overseer of spinning for Henry B. Farrell, woolen and merino yarn spinner, Philadelphia, has resigned. Mr. Lowe is the secretary of the Carders and Spinners Association of Philadelphia.

—William Watson is now manager of the Waverly Worsted Yarn Mills. Mr. Watson was formerly boss spinner with John and James Dobson at Falls of Schuylkill, Philadelphia.

J. L. Katadee, of Fitchburg, is now employed in the carding room of the American Mills Co., Rockville, Conn.

Knit.

—Charles S. Conover, an engineer in the Pioneer Knitting Mill, Amsterdam, N. Y., fell in the mill, and one of his shoulders and two ribs were broken.

—Wm. C. Colburn, bookkeeper in the Clyde Knitting Mill, Waterford, N. Y., has resigned.

—Thomas Sloan, foreman of the knitting department at the Dunham Hosiery Co.'s mill, Naugatuck, Conn., cut his hand badly while putting on a belt.

—Mr. Phillips, formerly superintendent of the Aetna Mill, Troy, N. Y., is now with the Troy Knitting Co., Mr. Organ having resigned.

—Jacob Ross has succeeded Winfield Mincher as bookkeeper in the Riverside Knitting Mill, Cohoes, N. Y., Mr. Mincher having gone to the Clyde Knitting Co., Waterford, N. Y.

—James O'Rourke has been engaged as night carder in A. V. Morris & Sons' No. 3 knitting mill, Amsterdam, N. Y.

—George Owen, bookkeeper in the Halcyon Knitting Mill, Cohoes, N. Y., was married to Miss Sarah Davis, who is a soloist in St. John' Church choir, Cohoes.

Deaths.

—Edward R. Powers, for a number of years superintendent of the New York Cotton Exchange, died recently of pneumonia, at the age of 58 years.

—Henry Mauger, a well known woolen manufacturer of Germantown, died very suddenly. Mr. Mauger, with a party of friends, was on a hunting trip, and shortly after arriving at Marshall's Creek, complained of sickness, and retired. Soon after, he was found lying on the floor dead.

—Abraham Morrison, of the firm of A. S. Morrison & Bros., Braintree, Mass., died recently at the age of 50 years.

—David Harpster, known throughout the country as one of the most extensive wool growers in Ohio, died recently at Harpster, O.

—Alfred S. Marchant, a well-known mill man of Cohoes, N. Y., died Nov. 5th. A widow and four children survive him.

—Charles M. Brandon, superintendent of the Cherry Cotton Mills, Florence, Ala., died recently. Mr. Brandon had been in poor health for some time.

—James V. Turner, who was lately appointed superintendent of the Brown Mfg. Co., Dover, Me., died recently of appendicitis.

—James Norton, overseer of the weaving department at the Warren Woolen Co., Stafford Springs, Conn., died Nov. 19th, aged 44 years old. Since Mr. Norton's removal from Hampden, Mass., ten years ago, until his death, he had been connected with the Warren Mills.

—R. Rounds, for many years in the employ of the Everett Mills, Lawrence, Mass., as boss spinner, died recently.

—Michael Maloney, of Proctorsville, Vt., formerly overseer in finishing department of Josiah Perry's mill, Webster, Mass., died Oct. 27th.

—Michael Gilfillen, boss carder in the United States Rubber Co.'s knitting mill at Woonsocket, R. I., died recently of typhoid fever, aged 31 years.

—Moses A. Dunton, overseer of the yard crew at the Lockwood Co.'s mills for twenty years, died recently at his home in Waterville, Me., aged 54 years. Mr. Dunton was connected with erecting the Barker Mill in Lewiston, and also the Lockwood mills in Waterville.

—Thomas Duffy, an employee for a number of years at George C. Moore's mill, North Chelmsford, Mass., died recently.

—Thomas Lape, at one time extensively interested in the flax mills at Valley Falls and Schaghticoke, died last month at his home in Valley Falls.

—William Moorcroft, an old Vermont manufacturer, died in Barre last month at the age of 76. Mr. Moorcroft came to this country when he was six years old, his family first settling at Andover, Mass. He learned his trade with James Gould at Gouldsville, Vt., and remained with him for 19 years. Forty-five years ago he, together with Joseph Barker, of Quechee, Vt., started a flannel mill at Jockey Hollow in Barre. He was subsequently interested in mills in North Montpelier, and afterwards came back to Barre and continued his mill there until 1893, when, being in failing health, he closed the mill and gave up business.

—William Holt, an old woolen manufacturer of Springfield, Pa., died last month at the age of 77. Mr. Holt was a native of England, and for some twenty years operated the mill in Springfield with his brother, under the name of Holt Bros. In 1872 he withdrew from that firm and, joining his brother-in-law, formed the firm of Fitzpatrick & Holt, and until within six years operated the Canton Mills at Manayunk.

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Cotton: Inspection and Selection
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Process
Machinery and Power
Twist and Elasticity
Temperature and Humidity
Numbering and Testing
Yarn-testing Apparatus
Explanation of Tables
Standard Strength Tables (Four Qualities)
Standard Table (Good Quality), to Quarter Numbers
Draper's Strength Table
Hyde's Strength Table
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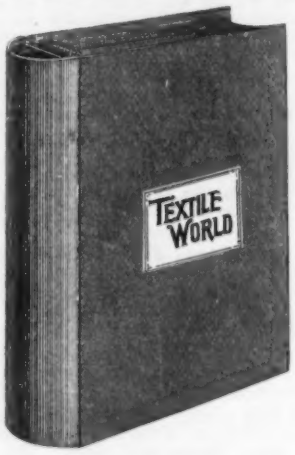

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Alphabetical Index to Advertisements follows this Classified List.

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Woonsocket Machine & Press Co, Woonsocket, R. I.

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See under Yarns.

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Link Belt Machinery Co., Chicago, Ill.
See also Mill Supplies.

Belt Dressing.

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Field, Frank E., New Haven, Conn.

Bindings.

See Tapes and Braids.

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Nashua Spool and Bobbin Co., Nashua, N.H.

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Pearson, J. T, Kensington, Pa.

Braids.

See Tapes, Braids and Edgings.

Brushers.

See Napping Machines.

Burr Pickers.

Curtis & Marble Machine Co., Worcester, Mass.
Sargent's, C. G., Sons, Graniteville, Mass.

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Ashworth, Elijah, Fall River, Mass.
Leigh, Evan A, 35 Mason Building, Boston.

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Butterworth, H. W., Sons & Co., Philadelphia.
New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
See also Dyeing, Bleaching Machinery, etc.

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Townsend, Thos., Providence, R. I.

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New Bedford Copper Co, New Bedford, Mass.
Phillips Co, The Thomas, Providence, R. I.
Revere Copper Co, 174 Oliver St, Boston.

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Phillips Co, The Thomas, Providence, R. I.

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Altemus, W. W, & Son, 2816 N. 4th St, Phila, Pa.
Ashworth, Elijah, Fall River, Mass.
Cobb, Thad. S., Machinery Co., Lowell,
Crompton & Knowles Loom Works, Worcester, Mass.
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Sargent's, C. G., Sons, Graniteville, Mass.
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See Wool and Waste Dusters.

Dyers, Bleachers and Finishers.

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Phillips, The Thomas Co, 91-95 South Main St, Providence, R. I.
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Mayo Knitting Machine & Needle Co, Franklin, N. H.
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Wardwell Needle Co, Lakeport, N. H.

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Draper Company, Hopedale, Mass.
Fairmount Machine Works, 22d and Wood Sts. Philadelphia.
Furbush, M. A, & Son Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St, Phila Pa. (For wire.)
Kilburn, Lincoln & Co, Fall River, Mass.
Lowell Machine Shop, Lowell, Mass.
Mason Machine Works, Taunton, Mass.
Whitin Machine Works, Whitinsville, Ms,
Woonsocket Machine & Press Co, Woonsocket, R. I.

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Loom Picker Co, Biddeford, Me.

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Dixon, Jos., Crucible Co, Jersey City, N. J
Graphite Lubricating Co, Bound Brook, N. J.

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Ferguson, John W, Paterson, N. J.

Mill Supplies.

American Supply Co, Providence, R. I.
Bamford & Smith, Passaic, R. I.
Bristol, The, Co., Waterbury, Conn
Buckley's, Benj. Son, Gun Mill, Paterson, N. J.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Thurston, A. G, & Son, Fall River, Mass.
Watson, L. S, Mfg.Co, Leicester, Mass.

Napping Machines.

American Napping Machine Co, Williamstown, Mass
Ardrey, S. B, & Sons, Bristol, Pa.
Curtis & Marble Machine Co, Worcester, Mass.
Jones, Lewis, 60 1-2 and Media Sts., Philadelphia, Pa.
Little Hustler Napping Co, Hudson, N. Y.
Woonsocket Napping Machine Co, Woonsocket, R. I.

Novelties.

Stohn, C, 178 Green St, Jamaica Plain Mass.

Pantagraphs for Mill Engraving.

Johnson, C. A, & Co, 22 Dey St, New York.

Patent Solicitors.

Crosby & Gregory, 34 School St, Boston, Mass.
Maskink, H., Amsterdam, Holland.
Phillips & Anderson, 53 State St, Boston.
Wright, Brown & Quinby, 53 State St, Boston, Mass.

Penstocks.

Dalrymple, George, Fair Haven, Vt.

Perforated Copper

Beckley, A. J. & Co., Garwood, N. J.

Peroxide of Sodium.

Roessler & Hasslacher Chemical Co., 100 William St, New York.

Picker Sticks.

Loom Picker Co., Biddeford, Me.

Picking, Carbonizing and Garnetting.

Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills 2025 Naudain St., Philadelphia.

Pipe Covering (Magnesia).

Keasby, R. A, 54 Warren St, New York.

Pneumatic Conveying.

See Ventilating.

Power Transmitting Machinery.

Ameledema Oilless Bearing Co, 149 West Berkley St, Wayne Junction, Pa.
Channon, H, Co, 25 Market St. Chicago, Ill.
Eastern Machinery Co, New Haven, Conn.
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Company, Staten Island, N. Y.
Hunter, Jas, Machine Co, No. Adams, Mass.
Jones, W. A, 53-59 South Jefferson Street, Chicago, Ill.
Kilburn, Lincoln & Co, Fall River, Mass.
Link Belt Machinery Co, Chicago, Ill.

Presses.

Crawford J. J, & Son, Nashua, N. H. (Power Screw, Hydraulic, Hollow Steam Plate.)
Curtis & Marble Machine Co, Worcester, Ms.
Hart, Charles, Frankford, Philadelphia.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, C. W. Co, Staten Island, N. Y.
Phillips Co, The Thomas, Providence, R. I
Pownall, F. H, Iron Works, Jamesburg, N. J.
Sullivan Machinery Co., Claremont, N. H.
Woonsocket Machine & Press Co, Woonsocket, R. I.

Pressing Irons, Gas and Air Heated.

Sheftall, C. H, Mgr, 305-307 Mercer St, New York.

Printers and Embossers.
Novelty Textile Printing Co, 447-449 W. 14th St, New York.

Pumps.
Goulds Mfg. Co, Seneca Falls, N. Y.

Reed and Harness Manufacturers.
American Supply Co, Providence, R. I.
Loom Picker Co, Biddeford, Me.
Walder, J, Paterson, N. J.

Ribbons.
Cheney Bros, S. Manchester, Ct.

Roller Skins.
Fell, Geo, & Son, Bolton, England.

Roofing, Gravel, Slag and Composition.
Armitage Mfg. Co, Richmond, Va.
Johns, H. W., Mfg. Co., 100 William St. New York.

Roofing, Paint and Paper.
Armitage Mfg. Co, Richmond, Va.

Roving Cans and Sheet Metal Work for Mills.
Hill, Jas, Mfg. Co, Providence, R. I.
Lauminar, Fiore Co., No. Cambridge, Mass.
N. E. Ventilating & Heating Co, 930 Manton Ave. Providence, R. I.
Sullivan Machinery Co, Claremont, N. H.

Sample Cards.
Merchants Sample Card Co., 79 Crosby St., New York.
Yerrington, F. M, 17 Batterymarch Street, Boston.

Schools.
American Correspondence School of Textiles, Lowell, Mass.
Lowell Textile School, Lowell, Mass.
Philadelphia Textile School, Phila, Pa.

Sewing Machines and Supplies.
Curtis & Marble Machine Co, Worcester, Mass.
Frame, Gibbons, 2nd and Diamond Sts, Phila, Pa.
Manufacturers' Supplies Co , 66 No. 4th St , Philadelphia.
Nye & Tredick, 606 Arch St, Phila, Pa.
Scott & Williams, 6th and Arch Sts, Phila, Pa.

Shearing Machinery.
See Dyeing, Drying, Bleaching and Finishing.

Shell Rolls.
Cohoes Foundry & Mach. Co, Cohoes, N. Y.
Thurston, A. G, & Son, Box 528, Fall River, Mass.

Shoddies.
See Wool Shoddies.

Shuttles.
See Bobbins, Spools, Shuttles, Etc.

Silk Machinery.
Butterworth, H. W. Sons Co, Philadelphia.
Crompton & Knowles Loom Works, Worcester, Mass

Singe Plates.
Butterworth, H. W. Sons Co., Philadelphia.
New Bedford Copper Co. New Bedford. Ms.
Revere Copper Co, 174 Oliver St., Boston.

Sizing, Starch and Gums.
Columbia Mfg. Co, 143-151 Pocasset St, Fall River, Mass.
Stein, Hirsch & Co, 165 Duane St, New York.

Slashers.
Cohoes Foundry & Machine Co, Cohoes, N. Y.
Lowell Machine Shop, Lowell, Mass.
Phillips C . The Thomas, Providence, R. I.

Soaps.
Holbrook Manufacturing Co., New York.
India Alkali Works, Boston, Mass.

Spindles.
Buckley, Benj's, Sons, Gun Mill, Paterson, N. J.
Draper Company, Hopedale, Mass.
Ward & Vandegrift, Elmer, N. J.
Whitin Machine Wks, Whitinsville, Mass.

Spindle Tubes.
Bamford & Smith, Pascoag, R. I.

Spinning Cylinders.
Hill, Jas, Mfg. Co, Providence, R. I.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Spinning Frames.
See Cotton Machinery.

Spinning Frames for Wool
Woonsocket Machine and Press Co., Woonsocket, R. I.

Spinning Rings.
Draper Company, Hopedale, Mass.
Whitinsville Spinning Ring Co, Whitinsville, Mass.
Worcester Spinning Ring Co, Worcester, Mass.

Spinning Tubes.
Buckley, Benj's. Son, Gun Mill, Paterson, N. J.

Steam Boilers.
Brown, C. H, & Co, Fitchburg, Mass.

Steam Boiler Insurance.
Hartford Steam Boiler Inspection & Insurance Co, Hartford, Conn.
Mutual Boiler Insurance Co, 31 Milk St, Boston.

Steam Engines.
Brown, C. H, & Co, Fitchburg, Mass.
Hooven (The), Owens & Reutschler Co, Hamilton, O.

Steam Specialties.
Butterworth, H. W. Sons Co., Philadelphia.

Tanks, Tubs and Vats.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, 195 High St, Boston, Mass.
Corcoran, A. J, 11 John St, New York.
Cypress Lumber Co, Apalachicola, Fla.
Stearns, A. T, Lumber Co, Neponset, Mass.
Woolford, George, 2240 No. 9th St, Phila, Pa

Tapes, Braids and Edgings.
Friedberger & Co, Germantown, Pa.
Goff, D. & Sons, Powtucket, R. I.
Krout & Fite Mfg. Co., Allegheny Ave. and Emeral t St., Philadelphia.
Weimar Bros, 1817 East York St, Phila, Pa.
Young, Wm. M, 3638-40 Frankford Ave, Philadelphia, Pa.

Tentering Machines.
See Dyeing, Bleaching Machinery, Etc.

Tension Pulleys.
N. E. Ventilating & Heating Co, 930 Manton Ave, Providence, R. I.

Testing Machines.
Howard, Geo. C., 1783 Barker St., Phila., Pa

Towers.
Caldwell Co., W. E. 202 Brook St., Louisville, Ky.
Challenge Wind Mill & Feed Mill Co, Boston, Mass.

Traveler's Cheques.
American Express Company.

Turbines.
(See Water Wheels.)

Ventilating Apparatus.
Allington & Curtis Mfg. Co., Saginaw, Mich., and East Cambridge, Mass
Berry, A. Hun, 23 W. 1st St, Boston, Mass.
Massachusetts Fan Company, Room 641, 53 State St, Boston.
New England Ventilating & Heating Co, Providence, R. I.
Philadelphia Textile Machinery Co, Hancock St, above Lehigh Ave, Phila, Pa.
Sargent's, C. G., Sons, Graniteville, Mass.
Sturtevant, B. F. Co, 34 Oliver St, Boston, Mass.

Washers (Cloth).
Hopkins, A, & Co. Bridgeton, R. I.
Hunt, Rodney, Machine Co, Orange, Mass.

Hunter, Jas, Machine Co, No. Adams, Mass.
Phillips Co, The Thomas, Providence, R. I.

Watches and Clocks.

Elgin National Watch Co., Elgin, Ill.

Watchman's Clock.

Eco Magneto Clock Co, 620 Atlantic Ave, Boston.
Nanz & Co, 116A Chambers St, New York.

Water Wheels.

Bradway, C. P, West Stafford, Conn.
Christiana Machine Co, Christiana, Pa.
Humphrey Machine Co., Keene, N. H.
Hunt, Rodney, Machine Co, Orange, Mass.
Leffel, James, & Co, Springfield, O.

Water Wheel Governors.

Bradway, C. P, West Stafford, Ct.
Cohoes Foundry & Machine Co, Cohoes N. Y.
Leffel, James & Co, Springfield, Ohio.
Lombard Water Wheel Governor Co, 61 Hampshire St, Boston.

Winders. (Hosiery.)

Universal Winding Co, 226 Devonshire St, Boston.

Wood Pulleys.

Saginaw Manufacturing Co, Saginaw, Mich.

Wool.

Lyon, John H, & Co, 12 Reade St, N. Y.
Pratt, Daniel S., 180 Summer St, Boston

Wool Cleaning Compound.

India Alkali Works, Boston.

Wool Combing Machinery.

Crabb, Wm, & Co, Newark, N. J.
Crompton & Knowles Loom Works, Worcester, Mass.
Townsend, Thomas, 157 Orange St, Providence, R. I.

Wool—Custom Work.

Lee Woolen Co, Springfield, Mass.

Wool Extracts.

Garfield Woolen Co, Garfield, N. J.

Wool and Waste Dusters.

Gerry, Geo, & Son, Athol, Mass.
Sargents', C. G., Sons, Graniteville, Mass.
Stillman-Randall Machine Co, Westerly, R. I.

Woolen and Worsted Machinery.

Altemus, W. W, & Co, 2816 N. 4th St, Phila Pa.
Bates & Judson, Lowell, Mass.
Butterworth, H. W. Sons Co., Philadelphia.
Cobb, Thad. S., Machinery Co., Lowell, Mass.
Crompton & Knowles Loom Works, Worcester, Mass.
Curtis & Marble Machine Co, Worcester, Mass
Fairmount Machine Works, 22d and Wood Sts, Philadelphia.
Furbush, M. A. & Son Machine Co, Phila, Pa.
Howard, Geo. C., 1783 Barker St., Phila., Pa.
Hunt, Rodney, Machine Co, Orange, Mass.
Hunter, Jas, Machine Co. No. Adams, Mass.
Jefferson, Ed, & Bro, 28 Strawberry St, Phila, Pa.
Philadelphia Textile Machinery Co., Hancock and Somerset Sts., Philadelphia.
Phillips Co The Thomas, Providence, R. I.
Sargent's, C. G., Sons, Graniteville, Mass
Stoddard, Haserick, Richards & Co, Boston, Mass.
Woonsocket Machine & Press Co Woonsocket, R. I.
Woonsocket Napping Machine Co., Woonsocket, R. I.

Wool, Hair and Noils.

Becker, Chas. W, Agt, Amsterdam, N. Y.
Fowles & Co, 106 Church St, Phila.

Wool Shoddies.

Becker, Chas. W, Agt, Amsterdam, N. Y.
Garfield Woolen Co, Garfield, N. J.
Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Riverdale Woolen Co, Riverdale, Northbridge, Mass.

Wool Sorters, Scourers and Carbonizers.

Kennebec Woolen Mills, 2025 Naudain St, Philadelphia.
Lee Woolen Co, Springfield, Mass.

Wool Washing, Preparing and Drying Machinery.

Phillips Co, The Thomas, Providence, R. I.
Sargent's, C. G, Sons, Graniteville, Mass.

Yarns, Threads, Etc.

Banding.

Moore, C. & Co, 12 S. 5th St, Phila, Pa.
Warren, W, Thread Works, Westfield, Mass.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Cotton Yarns.

American Spinners' Cotton Yarn Exchange, 45 Milk St, Boston.
Burnet & Co., 24 George Sq., Glasgow, Scotland.
Catlin & Co, New York and Boston.
Clark, Wm, Co, Westerly, R. I.
Cohannet Mills, Taunton, Mass.
Dana Warp Mill, Westbrook, Me.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Fleming & Chapin, Philadelphia.
Germantown Spinning Co, Germantown, Pa.
Grant Yarn Co, Fitchburg, Mass.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hadley Co, Holyoke, Mass.
Hawes, O. S, & Bro, Fall River, Mass.
Indian Orchard Co., Indian Orchard, Mass.
Jenckes, E., Mfg. Co., Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York City.
Mitchell, Jas. E, & Co, Boston and Phila, Pa.
Montgomery, J. R, Co, Windsor Locks, Ct.
Monument Mills, Housatonic, Mass.
Orswell Mills, Fitchburg, Mass.
Sanford Spinning Co, Fall River, Mass.
Tucker & Cook Mfg. Co, Conway, Mass.
Whittier Cotton Mills, Lowell, Mass.

Gassed Yarns.

Greene & Daniels Mfg. Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.

Glazed Yarns.

Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Indian Orchard Co., Indian Orchard, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Malcolm Mills Co, Frankford, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Harness Twines.

Fawcett, Hughes, 115 Franklin St., N. Y.
Hadley Co, 95 Milk St, Boston, Mass.
King, Alex, & Co, 54 Leonard St, New York.
Moore, C., & Co., (S. W. cor. 5th and Market Sts.)
Warren, W, Thread Works, Westfield, Mass
Whittier Cotton Mills, Lowell, Mass.

Hosiery and Knitting Yarns.

American Spinners' Cotton Yarn Exchange, 45 Milk St. Boston, Mass.
Boyer, B. F, & Co, Camden, N. J.
Campbell, Geo, & Co, Phila, Pa.
Clark, Wm. Co, Westerly, R. I.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Cohannet Mills, Taunton, Mass.
Colchester Mills, 86-88 Franklin St, New York.
Eichmann & Sternberg, 530 Broadway, cor. Spring St, N. Y.
Germantown Spinning Co, Germantown, Pa.
Greene & Daniels Mfg. Co, Pawtucket, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.

Jenckes, E., Manufacturing Co, Pawtucket, R. I.
King, Alex, & Co, 54 Leonard St, New York.
Mitchell, James E, & Co, Phila. and Boston
Monument Mills, Housatonic, Mass.
New England Thread Co, Pawtucket, R. I.
Orswell Mills, Fitchburg, Mass.
Rockwell, E. M, Leominster, Mass
Sanford Spinning Co, Fall River, Mass.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A T, & Co, 47 Leonard St, N. Y.
Walcott & Campbell Spinning Co, New York Mills, Oneida Co, N. Y.
Warren, W, Thread Works, Westfield, Mass.
Whittier Cotton Mills, Lowell, Mass.

Flax, Hemp, Jute and Ramie.

Burnet & Co., 24 George Sq., Glasgow, Scotland.
Eichman & Sternberg, 530 Broadway, cor Spring St., N. Y.
Fawcett, Hughes, 115 Franklin St., N. Y
Holland & Webb, N. Y.

Mohair Yarns.

Eichmann & Sternberg, 530 Broadway, cor Spring St., N. Y.
Goff, D. & Sons, Pawtucket, R. I.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Novelty Yarns, Tinsels, Silk Noils, Etc.

Burnet & Co., 24 George Sq. Glasgow, Scotland.
Cranston Worsted Mills, Bristol, R. I
Eichmann & Sternberg, New York City.
Indian Orchard Co., Indian Orchard, Mass.
Malcolm Mills Co, 229 Chestnut St, Phila, Pa.
Montgomery & Co, J. R, Windsor Locks, Ct.
Skerry, A. T, & Co, 47 Leonard St, N. Y.

Silk Yarns.

Cheney Bros, S. Manchester and Hartford Ct.
Eddy & Street, Providence, R. I.
Eichmann & Sternberg, 530 Broadway, cor. Spring St , N. Y.
Hawes, O. S, & Bro, Fall River, Mass.
Ryle, Wm, & Co, 54 Howard St, N. Y.

Woolen and Merino Yarns.

Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Clasgens, The J. & H. Co, New Richmond, Ohio.
Eddy & Street, Providence, R. I.
Hyde, E. S, 223 Chestnut St, Phila, Pa.
Jenckes, E. Mfg. Co., Pawtucket, R. I.
King, Alexander & Co, 54 Leonard St, N. Y.
Rockwell, Edward M, Leominster, Mass.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.

Worsted Yarns.

Alleghany Worsted Mills, Phila, Pa.
Botany Worsted Mills, Passaic, N. J.
Boyer, B. F, & Co, 516 Market St, Philadelphia, Pa.
Campbell, Geo, & Co, Phila, Pa.
Cranston Worsted Mills, Bristol, R. I.
Croft, Howland, & Sons, cor. Broadway and Jefferson Ave., Camden, N. J.
Eichmann & Sternberg, 530 Broadway, cor. Spring St., N. Y.
Elasser, Albert R, Addingham, Pa.
Goff, D. & Sons, Pawtucket, R. I.
Herbst & Jones, 21st and Naudain Sts, Philadelphia, Pa.
King, Alexander & Co, 54 Leonard St, N. Y.
Phoenix Mills Co, 13 Letitia St, Phila, Pa.
Shimer, Geo, & Son, 5th and Erie Sts, Camden, N. J.
Skerry, A. T, & Co, 47 Leonard St, N. Y.
Solis, Andrew J, Jr, & Co, 179 Devonshire St, Boston, Mass.
Waverly Worsted Co, Main St. and Green Lane, Manayunk, Pa.

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MILLS FOR SALE! Woolen Mills and other manufacturing plants
Agent for Sale of Mill Properties.
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The advertisers in the following columns should be addressed in care of TEXTILE WORLD, or inquiries concerning them may be addressed directly to "Information Department, TEXTILE WORLD," as full particulars of each advertiser are on file, and the addresses of suitable agents, superintendents and foremen for every branch of the textile industry will be furnished to manufacturers.

Any subscriber may file his application, and no charge is made until position is secured.

The business of this department is held strictly confidential.

The applications of good overseers in every department, who are in want of positions, are solicited.

Manufacturers are invited to use this department when in need of skilled men; each case will be handled confidentially, with promptness and judgment, and without charge to manufacturers.

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WOOLEN SUPERINTENDENTS.

1454 **Superintendent, Manager or** Designer. Has worked on worsteds, cassimeres and cheviots. Is Scotch, but has worked a number of years in this country and in Canada. Good references.

1443 **Agent or Supt. of Woolen Mill.** Age 42; married. Has been manager, supt. or assistant supt. for the last twenty years. Experienced in all classes of goods and makes of machinery. Has good references. A first-class manufacturer.

1452 **Superintendent or Designer** for woolen mill. Age 42; married, American. Has had a large experience, and is well recommended. Out of employment at present on account of his mill shutting down, and can take a position at once on moderate salary. Has worked on all classes of woolen goods, cotton warps, and has had 13 years' experience on fancy woolen dress goods. Familiar with the Knowles looms and Davis & Furber cards and mules.

1398 **Woolen Superintendent or De**signer of recognized ability and at present employed as a superintendent of 36 set woolen and worsted mill. He finds it necessary to remove from New Jersey on account of his wife's health. His past record is first-class and this is an unusual opportunity to secure the services of a first-class superintendent.

1250 **Superintendent,** or would accept a position as designer in a good woolen mill. Understands fancy cassimeres, cloakings, dress goods, kerseys, unions and worsteds. Can produce the Jacquard effect on an ordinary cotton, Knowles loom. Refers to good mills.

935 **Woolen Supt. and Designer.** Graduate of German Textile School. Has managed successfully two mills in the West. Thoroughly up on designing and general mill management. Age 35. Married. References first-class.

1387 **Woolen Superintendent,** one who has had a thorough practical experience in setting up and operating woolen mills. Would take charge of small mill or finishing department in large mill. Now employed but wishes to change. Correspondence solicited.

1268 **Woolen** superintendent or designer. First-class experience in England and America. A first-class man in every way; age 34; married. Fancy worsteds, cheviots, novelty goods, cassimeres, overcoatings, cloakings, dress goods, piece dyes, worsteds and cheviots.

COTTON SUPERINTENDENTS.

1464 **Superintendent of Fancy Cot**ton Weaving. Age 43; married; an American. Will not work outside Northern and Eastern states. Has worked on fancy goods of all kinds, white and colored cottons, worsteds and silks. Is familiar with all makes of looms and dobby heads. Is at present employed, but wishes to better himself, if possible. Refers to present and past employers.

1453 **Superintendent** desires position in a cotton mill. Age 26; married; American. Has worked on prints, fine satteens, sheeting ginghams, duck, denims, cottonades, ticks, awnings and domets. Is familiar with all makes of spinning, spooling and warping machinery. At present employed, but wishes to obtain a more advanced position. Refers to present and past employers.

1332 **Supt. with long experience** in both Northern and Southern mills, on print cloths, broad and narrow sheetings and fine shirtings. First class references from all past positions. Age 48. Might accept position as overseer of large weave room.

1108 **Cotton Superintendent** or would accept position as overseer of large mule spinning department. Has good references and a first-class record, and is a thorough mechanic; familiar with all kinds of yarns, especial hosiery and prints; age 40 and married.

578 **Cotton Superintendent** with experience as boss carder, master mechanic and superintendent on prints, sheetings, twills and sateens. An American of high character, and whose ability is proved by past record. Age 35, married; can accept position at once.

1390 **Cotton Superintendent.** Especially qualified for a mill making dress goods and fine shirtings. Experience with first-class mills as designer and manager. A young man of high character. At present employed.

1269 **Cotton** superintendent, carder, spinner and dresser; 48; married. Has held position in some of the best mills; is strictly temperate, and well recommended. Cotton, flannels, ginghams, crochet and Marseilles quilts, etc.

1236 **Supt. of Cotton Mill** desires to change position. Is thoroughly competent, steady and reliable. Good mechanic, manager, push and executive ability. Over 15 years experience, and fully understands how to keep production right as to quantity, quality, and lowest cost. Best system of economy maintained. First-class references can be given.

WOOLEN CARDERS.

1367 **Boss Carder** of wool, shoddy, or cotton. More than 12 years experience as boss carder in leading knitting mills in N. Y. At present employed but desires to change for $3 00 a day or better. Can take charge of mule spinning also. Married; age 36; American.

1180 Wants position as 2nd h nd of carding in woolen or knit mill. Age 23; single. Has been successful in like position. Prefers position in Mass., R. I., Conn., N. H., Penn., N. Y. or N. J. References if required.

1314 **Woolen Carder.** American. Age 30. Married. At present employed. Experience on beavers, cassimeres, cheviots, dress goods. Well spoken of by former employers. A first class man for a small mill.

1358 **Wool Carder**, now employed as second hand in large mill. Highly spoken of by past employers, habits, character and ability A1. Capable of taking charge of a room. Experience on high and low grade stock. Age 27, American, married.

1357 **Woolen Carder** now employed in satinet mill, has had 11 years' experience on fine goods and wishes to get back to that work; qualified to take a first class job. Age 39, English, married.

1248 **Carder,** woolen. Age 37 years; married. 10 years with one of the best mills in New England. Dress goods, beavers, blankets, cotton warp hair lines and kerseys.

1378 **Overseer Woolen Carding.** American, age 32, married. With one mill 13 years, and another 4 years. Excellent references from each. A first-class carder in every way.

COTTON CARDERS.

1432 **Overseer Cotton Carding.** This man has worked up from sweeping boy to overseer in the same mill and we have a letter from the former manager expressing the highest regard for his ability and character. Age 30, Married.

423 **Cotton Carder or Supt.** At present in the South but desires to return to the North. Early training and most of his experience was in N. E. mills. Understands combing. Age 38. Married

1368 **Overseer on Second-Hand Cotton** Carding wants a position in small room at $2.50 per day or upwards. Will do his own grinding. Or, would take a first-class second hand job. Last five years in one place. Thoroughly practical and understands all the machinery in the card room. Age 37; married. Good reference. Prefers New England.

1238 **Second** hand of cotton carding. 37; married. Open for engagement.

1403 **Cotton Carder** with 17 years experience in N. E. mills as overseer and second hand, now in the South but wants to return North. Has never worked for less than $3.00 but would take $2.50 to change. Married. Age 38. Best of references.

1339 **Cotton Carder,** young man holding first-class position in New York State, would like position in Eastern or Middle States as assistant superintendent or boss carder paying $5.00 or more a day. Is worth that salary; experience and references of the best.

WOOLEN SPINNERS.

1461 **Spinner, on Cotton or Wool.** Age 33; married; French. Has worked in one of the best thread works in this country, also in Alsace-Lorraine, on yarns from 70s to 160s. Is familiar with Dobson & Barlow machines and Schlumberger mules.

1299 Woolen Spinner who has had experience as second-hand would like a position as boss spinner. Would accept small salary to start. Has worked on cloakings, dress goods and Scotch tweeds in New England mill.

1276 **Spinner,** woolen. Wool and shoddy from 1-2 to 10 run, cassimeres, flannels, dress goods, underwear and blankets. Davis & Furber, Furbush & Sons, Johnson & Basset, and Schmidt machinery. Good references.

633 **Woolen Mule Spinner** desires to move from Maine on account of wife's health. At present in good position. Age 37; married, Scotchman.

COTTON SPINNERS.

1424 **Overseer, Spinning.** Mules preferred. At present employed in N. B. mill. Has held position as overseer 6 years. Single. Will go anywhere.

1407 **Cotton Frame Spinner** now in charge of nearly 30,000 spindles in a Southern mill wants to return north. First-class reference both north and south where he has worked. Age 30. Married. American.

1438 **Cotton Mule Spinner** who has worked on plain white goods only desires to secure a permanent position in the Eastern or Central states. Has good references and is perfectly reliable. Age 45. Married.

1429 **Cotton Ring Spinner** who has been overseer 5 years and second hand 8 years. Worked on white and colored yarns, spooled and twisted. Refers to past employers in Maine and Mass. Age 36. Married.

1350 **First-Class Ring Spinning** overseer, also spooling, warping, slashing, web drawing; large experience, highest references as to skill, character and executive ability. At present employed in Fall River. Age 48, American.

1187 **Overseer of Dressing** or spinning wants a position in a cotton mill. Is an A1 man on colored or white goods, and understands slashing and beaming thoroughly. American; age 38; married. Has had charge in some of the best mills of New England. Sheetings, shirtings, dress goods, cheviots, flannels and sateens. Familiar with Mason, Whitin and Lowell machinery.

1280 **Wanted, situation** as overseer or second hand of mule spinning by a thorough, practical man. Good references from past and present employers. Understands all English makes of mules. Will go South or Canada.

1158 **Overseer of Ring Spinning,** spooling, warping and slashing wants position on white work, fine or coarse. Age 46; single. Will go anywhere. Good references. Familiar with Mason, Bedford, Lowell and Fales & Jencks machinery.

WOOLEN WEAVERS.

1433 **Overseer Woolen Weaving.** More than 18 years' experience in large mills in Canada and the States. He is highly recommended for position of boss weaver or assistant superintendent. Experience covers a large variety of cloths on Crompton & Knowles looms. Age 36. Married.

1434 **Boss Weaver, Woolens.** Wants a job in a large mill and can handle same in good shape. Age 36. Married. Has made fancy worsteds, fancy cassimeres, meltons, dress goods, etc.

1340 **Worsted Weaver** would like position in a small mill at moderate salary; experience as fixer and in cloth room. Age 38, married. Knowles and Crompton looms; references good.

1130 **Overseer of Woolen Weaving** wants position. Would accept 2nd hand's position in a good mill. American; protestant; age 36; single. Good man on Knowles fancy and plain looms, also Davis & Furber. Cassimeres, worsteds, meltons and flannels. Will not go South, West or Pennsylvania.

1385 **Worsted or Woolen Weaver** of fancy worsted and woolen mens' wear and novelty dress goods. Has held positions in leading N. E. and Phila. mills. Expert on Crompton & Knowles looms: Best references. Age 38; married. Can start at once.

COTTON WEAVERS.

1463 **Overseer** of Cotton or Woolen Weave Room, or overseer and designer in small weaving room. Age 40; married; English. Has worked on plain and fancy cottons, cotton flannels, suitings, twills, velveteens, corduroys, etc., and a great variety of woolen and worsted goods. Is familiar with all makes of English and American machinery, cotton looms, plain and fancy; Knowles & Crompton woolen looms. Is not at present employed and can take a position immediately. Good references.

1459 **Fancy Cotton Weaving,** Slashing, etc. Age 36; married. Has worked on all kinds of fancy goods and is thoroughly competent in all departments of manufacturing, with the exception of spinning. Understands velvet and corduroy weaving. Is not at present employed and can take a position immediately.

1425 **Overseer, Cotton Weaving** Age 38. Married. At present employed in large Mass. mill where he has been for 7 years as overseer. Worked on all kinds of goods and is well experienced. American. Refers to past and present employers.

1380 **Overseer Cotton Weaving.** Held overseer's position for 5 years in Mass. mill, but now out because of change in management. A man of well-known ability. Age 48; married, American. One of the best weavers in New England. Will go South to a good position.

1334 **Jacquard and Dobby Weaver** and designer on Knowles machines. 8 years' experience in this position. At present employed and can furnish excellent references. Age 38; married.

1333 **Overseer of Cotton Weaving** with more than 20 years' experience in weave rooms of N. E. and Canadian mills. Experience on all kinds of white and colored, plain and fancy work, except Jacquard, American and English, looms. Married; age 37.

DYERS.

1457 **Dyer.** Age 26; has worked on yarns, pieces, raw stock, indigo vats and cotton yarn. Is at present employed, but can take a position on short notice. Refers to past and present employers.

1458 **Dyer.** Good man on fast black and colors. Age 38; married; Swiss. Has worked on silk, cotton skeins and stockings. Has had a good practical experience and can furnish first-class references.

1460 **Boss Dyer.** Age 32; married; English. Will take a position in any of the Northern states, but prefers the vicinity of Philadelphia, if possible. Is at present employed, but can take a position after Jan. 1st. Has worked on cotton yarns, braids, cotton piece goods, hosiery, raw cotton and worsted yarns. Is familiar with Pierce & Bray cotton yarn dyeing machines, jigs and ordinary piece kettle machines.

180 **Woolen Dyer.** Age 42; married. Has had a large experience, and is a good practical man. Used to all classes of goods. Has worked largely on government orders. Good indigo dyer. Refers to former employers and others.

1442 **Boss Dyer.** Age 30 years; married. Has worked on all kinds of goods except cotton. Has excellent references. Refers to former employers and others

1440 **Dyer.** Age 50; married, American. Has been in first-class mills and refers to them. Has worked on raw stock, wool, shoddy, and cotton, also piece dyes.

1426 **Dyer,** silk or cotton. Age 45. Married. Italian. Learned trade in France. Has worked 23 years in this country in good mill. Refers to past employers.

1427 **Second Hand Cotton Piece** Dyer. Age 38. Married. Worked on canton flannels, sateens, drills, ducks and all kinds cotton piece goods. Was 12 years in one mill as second hand. At present employed but can leave at once. Well recommended.

1415 **Dyer.** Now out of work on account of the mill being stopped. Aged 30, and married. Will start for small pay. Accustomed to Beavers, Broad and Carriage cloths, Repellents, fancy Cassimeres, Raw Wool and Cotton, light shades or piece dyes. Refers to past employers.

FINISHERS.

1428 **Overseer of Napping.** Young man just out of position because his mill stopped making fleece lined underwear. Experience on French machines and Davis & Furber cloth and knit nappers. Can refer to leading Mass. mill men for whom he has worked. Will go West. Single.

1214 **Woolen and Worsted Finisher.** A first class man. One that has had a thorough experience in one of the best mills in New England.

1437 **Finisher** wants to change present job for one paying $2.50 or more. Has had a wide experience for a young man. Has worked on many kinds of machines and has good references. Single. Age 30.

1351 **Woolen and Worsted Finisher** with 7 years' experience as overseer in R. I. and N. Y. mills, from which he has excellent references. At present second hand in one of the best worsted mills in N. E. Habits first-class; age 29, married

KNITTERS.

1455 **Superintendent, Boss Knitter** or Sewing Machine Fixer. Age 32; married. Not at present employed and could take a position at once. Has worked on balbriggans, together with all kinds of ribbed goods and flat work. Is familiar with the leading makes of knitting machines and all kinds of sewing machines. Good references.

1450 **Foreman or Superintendent of Hosiery.** Age 40; married. Has worked on cut feet, seamless half hose, ladies' and children's hosiery. Is familiar with every standard make of knitting and sewing machines. Is first-class finisher, and can start new plant. Salary moderate. Prefers to go South, if possible. Refers to former and present employers.

1441 **Supt. or Overseer in Hosiery** Mill. Age 49; married. Wishes to obtain a position near Boston. Cannot take a position before January 1st, 1899. Has worked on all classes of knit goods and is familiar with all the leading makes of machinery. Refers to past employers.

1405 **Boss Knitter.** Young man with good knowledge of knit goods. A1 on circular ribbers. Thoroughly experienced on mittens, leggings and golf hose. owns 3 machines. Can bring best of references from large concerns. Desires position with good house.

1362 **Boss Rib Knitter**, young man, now second hand in fleece lined underwear mill in New York State wants to advance. Very highly spoken of by present employers as to both ability and character. Could change on short notice.

1435 **Boss Knitter** Underwear, astrakhans, stockinet, rubber linings, etc. Efficient workman on circular spring needle machine. Age 36. Married.

DESIGNERS.

1444 **Designer.** Has made a special study of designing during the past ten years. Wants a position which offers chance for advancement. Has worked on all classes of goods and is familiar with standard makes of machinery. Can fix, set up and has started sections of new fancy looms.

1445 **Designer or Finisher**, or will take position as supt. of a small mill. German, protestant, age 36, married. Has worked in several New England mills and refers to them. Graduate of the Werden Textile school, Saxony. Has worked on kerseys, beavers, cassimeres, cheviots, etc. Is familiar with all makes of American and German machinery.

1447 **Assistant Supt. or Designer.** American. A graduate of Philadelphia Textile school and has worked in Philadelphia and Massachusetts mills. Wishes to obtain a position in Philadelphia or vicinity. Has worked on cotton shirtings, woolen and worsted dress goods and men's wear. Is familiar with all American makes of machinery. Can give good references.

1449 **Overseer of Weaving or Designer.** Age 38; married; American. Thoroughly capable. Has designed his own goods for eight years, and studied designing for two years. Left last position on account of sickness, and will take a small salary to start. Has worked on all classes of cottons, plain and fancy, and is acquainted with all makes of machinery. Refers to former employers and others.

MISCELLANEOUS.

1465 **Superintendent or Manager** of carpet mill manufacturing tapestries, Brussels, velvet, Axminster or Moquette carpets. Age 41; married; American. Is at present in the wholesale and retail carpet business, but has had 18 years' experience in the manufacture of Axminster and Moquette carpets, from spinner to superintendent. Is at present employed, but can take position immediately. Wishes to obtain engagement for at least two years, to start. Can furnish excellent references.

1462 **Colorist, Chemist,** or Assistant in Print Works. Age 25; single; American. Acquainted with the printing of silkolines, sateens, cretonnes, dress goods, etc., and has a good knowledge of special processes. Is familiar with all machines used in bleaching, dyeing, printing and finishing. Is a graduate of the M. I. T. in Chemical Engineering.

1456 **Engineer.** Age 32; married; American. Wishes to obtain work in New England. Is not at present employed and can take a position at once. Is familiar with Corliss and high speed engines; can do his own indicating and adjusting and is a practical electrician.

1404 **Chief Engineer and Machinist.** A man who is fitted by education and experienc to take charge of a large plant. Well acquainted with all kinds of mill machinery. Has hadcharge of erection of steam, water and electrical plants, pumping machinery and cotton mill equipment. Would be an excellent man to superintend the erection of a new plant and economical operation of same.

1451 **Mechanic or Chief Engineer.** Age 37; married; American. A first-class mechanic and engineer. At present employed, but wishes to obtain a position where there is a better chance for advancement. Has been 2½ years in present position as master mechanic, and was previously for 13 years with one firm as department foreman, engineer and master mechanic. Refers to former and present employers.

1448 **Cashier or Bookkeeper.** Age 26; American, single. Is a college graduate and has been bookkeeper and paymaster for one firm for eight years, to whom he refers. He is competent to take any position of trust in a mill office.

1446 **Boss Machinist or Engineer.** American, 35 years old, married. 12 years in last place. Refers to former and present employers. Familiar with all repair work in cotton mill.

1335 **Loom Fixer or Second Hand.** Knowles and Crompton looms, fancy worsteds and cassimeres, dress goods. German; Protestant; age 37, married. Has been employed in good mills and is very well recommended.

1436 **Boss Dresser.** At present out of work because mill is running slack. Experience covers a large line of goods on D. & F. and Cleveland machines. Would start at $1.25 a day if work was steady. Age 26. Single. A very reliable young man.

1301 **Book-keeper and Paymaster.** Young man of the very highest character desires to move away from the Atlantic coast, on account of his health. Best references from his present and former employers.

1418 **Cloth Hall.** Overseer, shipping clerk or paymaster. Has had a thorough experience in each of the above positions and is familiar with white and colored cotton goods. Is well recommended. Aged 35. Married, and is also a good all around accountant.

TEXTILE BOOKS.

The following are recent publications, which we will furnish upon receipt of their price.

Plain Series of Cotton Spinning Calculations, by William H. Cook, 91 pages.

This book gives original calculations relating to cotton spinning, giving the position of the different pulleys and wheels, which are taken into consideration when making calculations; and also points where the necessary changes are made when altering from one count to another. Price $1.

Sizing Ingredients, Size Mixing and Sizing. By Hugh Morrie Jr., 63 pages, Illustrated.

This book is intended to be a complete practical work dealing with everything relating to the modern processes of sizing, and takes up such subjects as sizing ingredients (flours, softeners, deliquescent substances); Size preparations (Chloride of Zinc, Whitening material, Percentage of size, etc.); Fermentation; Mixing; Construction of Sizing Machine; Working of the Machine; Definition of Technical Terms; Calculation, etc. Price $1.00.

Ornamental Design for Woven Fabrics, by Stephenson & Suddards. 273 pages, 66 illustrations.

This is a text book dealing with ornamental design for woven fabrics, for the use of the student, and has been written for the purpose of suggesting helpful ideas to designers and manufacturers of textiles, and aims at bringing artistic textile work into practical touch and closer relationship with the technical requirements of manufacturing. It takes up such subjects as Geometric Design; How to Plan an All-over Repeating Design; The Drop Pattern; The Sateen Arrangements; Borders, Corners, Stripes; The Structure of Ornamental Flowers, Foliage, etc. Price $2.50.

The Power Loom, by Alexander Brown.

This is a practical, well written treatise of 113 pages, on the construction of the power loom and the art of weaving, giving descriptions of the texture produced by different numbers of harnesses. The text is illustrated with diagrams, and contains calculations and instructions for the production of cotton, woolen, linen and jute fabrics. It was written with the intention of serving as a text book for those engaged in the trade. Notwithstanding it relates to English machinery, it is of value to those operating that of American make. Price $1.25.

Jacquard Weaving and Designing, by T. F. Bell. 300 pages. Fully illustrated.

The contents of this work have been derived from a long course of art and technical training, together with a lengthy practical experience in textile manufacturing and designing, by the author. The descriptions are as concise as is compatible with fairly clear explanation. Price $3.00.

Cotton Weaving and Designing, by John R. Taylor, 288 pages, fully illustrated.

This work is by a well known writer and lecturer on this subject, and treats of such topics as: Hand and Power Looms; Drop and Circular Box Looms; Dobbies; Jacquard and Leno Weaving; Terry Looms; Principles of Designing, Plain and Figured; and Textile Calculations. This work is of much value. Price $2.50.

Woolen Spinning, by Charles Vickerman.

This is a most excellent work for students in textile schools, and for skillful, practical men in woolen mills. It takes up the principles that underlie the various processes and operations of the earlier parts of manufacture. It has chapters devoted to Wool; Wool Sorting; Scouring; Bleaching; Mixing, etc., Carding and Spinning. 362 pages. Price $1.75.

The Student's Cotton Spinning, by Joseph Nasmith.

This is a standard book on spinning. It treats of mixing, opening, scutching, carding, card clothing, combing, roving, spinning, reeling, waste spinning, etc. 593 pages. Price $2.50.

The Mechanism of Weaving, by T. W. Fox.

A treatise of 464 pages, presenting exact and practical information upon the principles of weaving. Takes up such topics as Harnesses; Shedding; Dobbies; Jacquards; Card Cutting; Picking; Pickers; Swivel Weaving; Beating Up; The Reed; Taking-up Motion; Temples; Trimming and Fixing of Parts. 256 illustrations. Price $2.50.

Manual of Dyeing, by Knecht, Rawson and Loewenthal. In three volumes.

Decidedly the best work of the kind for a proper understanding of the present state of the art of dyeing, for the use of practical dyers, manufacturers and students. It takes up such subjects as, Water; Acids; Alkalies; Mordants; Natural and Artificial Coloring Matter; Machinery used for dyeing, etc. Has numerous illustrations and specimens of dyed fabrics. Price $15.00.

Draw Frames and Fly Frames. By Thomas Thornley, 380 pages.

This is the only work especially devoted to the drawing and roving processes, and is intended to benefit those who are directly concerned in the practical operation of the machines under discussion, with particular stress on the points which will give the best results from machines in their actual manipulation. Among the subjects treated may be mentioned the following: Drawing Frames; Fly Frames—Winding, Building Motion, Differential Motions; Roller Setting and Drawing; Defective Roving Bobbins; How to Put up Frames; etc. Price $2.25.

Cotton. By Christopher P. Brooks, 384 pages, 174 illustrations.

This is the most acceptable book on this subject that has been published. The subject has been presented in a remarkably attractive style, and is treated in a manner not to be found elsewhere. Cotton is considered in its botanical features, its cultivation, preparation for the market, and as an article of commerce. A full chapter is given on the commercial uses of the seed for oil, etc. It is a volume that will be of interest to the cotton factor, merchant, broker, and all whose business it is to buy or sell the fibre in its raw or manufactured condition. We cannot speak in too flattering praise regarding the merits of this book. Price $3.00.

The Best is the Cheapest.

It is BETTER and CHEAPER to wind yarn by the "Universal" system before shipment from the mill, thus insuring perfect delivery to knitting machines without rewinding.

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Solids, Mixtures, Bleached, Combed and Carded Egyptians. Cops and Cones.

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YARN DEPARTMENT.

Eastern Yarn Market.

Cotton Yarn: Spinners outside of the combination have a fair amount of orders on hand. The combination mills held to prices longer than the situation warranted, and were undersold by outside spinners. The combination is getting to be a farce, and has started many old spinners in making yarn who otherwise would not now be competing. The knitters have been working in many ways to beat the combine and have succeeded in many instances. The combination, by its methods, has brought this about. The marking of cases, "Special," the quoting of prices on yarn which is not listed; for instance, instead of making a low price on 20s which is listed, the break is made on 19¾s. Some of the knitters who stuck to the combination during the last light weight season, lost their entire season's business, and this season are buying Southern yarn. They say that Southern yarn in the low counts is no good, but in 20s and 24s the yarn works satisfactorily, and is at least two cents under.

Eastern Yarn: In many instances this two cents represents all the profits that the mill makes on its product. Much Southern yarn is being sold in skeins to the knitters of cheap imitation balbriggan and fleece lined plush underwear. This yarn is printed for mottle effects, and works well. The print cloth manufacturers are selling yarn to knitters. This yarn is satisfactory, with the exception of the small cops. Knitters are working in all ways to reduce the cost of their material, and are ready to place orders for heavy weight yarn, from 8s to 11s, at a price which varies from 11 to 11½ cents. The combination's price on this yarn is 12½ cents. Much yarn is being offered by the banks who have taken it for debt. This yarn is being sold under cost. While on general principles combinations should be frowned upon, we should not too severely condemn the cotton yarn Combination, because, before it was formed, spinners of large Eastern mills were selling their products at a loss, which would have ruined them had there not been some check put upon the practice of cutting prices unreasonably. We will state unhesitatingly, that yarn was offered to American knitters cheaper than it would have been sold for in Manchester, England. Colored yarn in Jaeger and Silver Gray is in demand, and some orders are being placed for delivery in March and April. This is mostly by those mills manufacturing men's underwear. The yarn for ladies' garments is not yet contracted for, and this yarn, with others, will not be ordered before January or February. We note that some mills running 1-11s are now using 1-22s, and are making two threaded garments. Also, there are other large buyers of yarn, who are putting in mules and preparing machinery of their own. This will reduce the outlet for some yarn. The advisability of knitters spinning yarn for their own consumption is very questionable, because many times spinners sell yarn under cost of production, and, besides, knitters who are out of the yarn market are not in a position to know the real condition of the market.

The yarn combination has broken down on carded white cotton yarn, but this is not so on combed yarns. In this latter branch of the industry, the combination is master of the situation, and prices on combed yarns are firmly maintained. The best combed yarn is selling best, and the most successful balbriggan manufacturers are running 1-40s, making a two threaded garment. These garments are growing in popularity. We note also that lisle 2-42s and 2-50s combed Egyptian and Allen-seed cottons are in good demand, with prices firmly maintained.

(Continued on page 137.)

Frank E. Patterson, Prest. Oscar W. Wood, Treas

Germantown Spinning Co.

COTTON CARDED

HOSIERY YARNS

In numbers from 6s to 36s.

Germantown, Philadelphia.

W. Warren Thread Works,

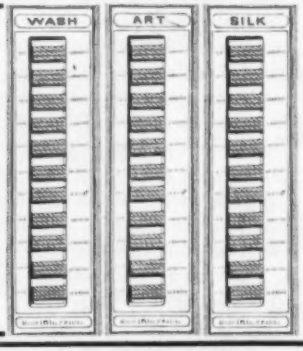
WESTFIELD, MASS.

HOSIERY AND SEAMING YARNS.

Also Polished Threads.

Our bleaching and dyeing facilities are new and unsurpassed for prompt and neat work. Correspondence solicited.

SAMPLES CROCHET SILK.



SAMPLE CARDS

FOR SHOWING

Silk, Cotton, Linen Threads;

Also Textile Goods.

MADE IN UNIQUE DESIGNS IN QUANTITIES.

F. M. YERRINTON,

17 Batterymarch Street, BOSTON, MASS.

Eddy & Street,

COTTON, WOOLEN, **YARNS** AND **BRAIDS** WORSTED, SPUN SILK.

PROVIDENCE, R. I.

Cohannet Mills,

TAUNTON, MASS.

Spinners of High Grade

HOSIERY YARNS OF EVERY DESCRIPTION.

Selling Agents JAMES E. MITCHELL & CO., Philadelphia and Boston.

DANIEL S. PRATT,

180 Summer Street, - BOSTON,

ROOM 24.

851 Calle Piedad, Buenos Aires.

SOUTH AMERICAN WOOLS,

..Personally Selected..

Graded to the Standard of U. S. Markets.

WAVERLY WORSTED CO.

SPINNERS OF

WORSTED YARNS

FOR WEAVING AND KNITTING.

Main St. & Green Lane, Manayunk, Philadelphia.

Continued from page 135

We believe that after the first of the year the effects of the English combination, which has been buying up the stock of the American fine spinners of thread and fine yarn, will be felt. The stock holders of some mills have done well, but those who own stock at high figures will lose money, while those who originally started the mills will make money. The object of this combination of English capital is to advance the price of thread and combed cotton yarn to a great extent. What are we coming to?

Worsted Yarn: Spinners are getting but few orders. The orders placed are to refill some placed earlier in the season. The light weight fancy worsted business has been a failure. Serges have sold well, and mills manufacturing this class of cloth have been fairly well employed. Yarn used is mostly ½ to ⅝ blood, from 1-12s to No. 2-36. Not many orders will be placed for yarn until after the first of the year, as weavers have no encouragement to place orders at this time. The methods of buying cloth are changing. The clothier and jobber are buying closer to their requirements. This has been brought about by the "skin flint" methods employed by retail clothiers. When salesmen call with samples on regular trips, the clothier refuses to buy, thinking that by holding off he can secure "job lots" at a price below cost.

The job lot racket is getting played out, and now the manufacturing clothier either buys serges where change in style does not force him to sell, or else he buys enough fancies to make, say, ten suits of a style. He sends his men out, and if the salesmen secure orders, the clothier places orders enough to cover his requirements, with the mills, and if the salesmen secure no orders that ends the matter. This acts in the manner of a row of bricks. When the first one starts, all start, and when orders are secured from the retailer, the weaver will get his order for cloth and

(Continued on page 139.)

CATLIN & CO.,
YARNS.
67 Chauncy St., Boston
216 Church St., New York.
206 Chestnut St., Philadelphia.

ALEX'R KING & CO.
YARNS.
FINE IMPORTED YARNS A SPECIALTY.
54 Leonard St., New York.

JAMES E. MITCHELL & CO.,
Commission Merchants.
122 & 124 Chestnut St., Philadelpia, Pa.
6 & 8 Summer St., Boston.
Cotton, Woolen & Worsted Yarns.
All numbers on Hand and Made to Order.

O. S. HAWES & BRO.,
WEAVING and HOSIERY **YARNS,**
All Plies and Numbers.
Imported Yarns a Specialty.
82 and 84 BEDFORD ST., FALL RIVER, MASS.

TUCKER & COOK MFG. CO
MANUFACTURERS OF
WHITE AND COLORED COTTON **WARPS**
Nos. 6s to 30s,
On Beams, Jack Spools or in Chain
CONWAY, MASS.

GRANT YARN CO.,
COMBED AND CARDED COTTON
YARNS 40s and above. AND
FITCHBURG, MASS. **WARPS**

E. JENCKES MFG. CO.
Colored Cotton, Hosiery, Woolen and Merino **YARNS**
PAWTUCKET, R. I.

LINEN YARN IMPORTER.
Hughes Fawcett, 115 Franklin St., New York,
Flax, Hemp & Jute Line and Tow Yarns,
FOR WEAVING PURPOSES
Linen Jacquard Harness Twines.
Fine Cotton Harness and Heddle Twines.
For Cotton, Silk, Woolen and Carpet manufacturers. Correspondence solicited. Samples promptly furnished.

CAPACITY, 50,000 Spindles.

ORSWELL MILLS

FITCHBURG MASS.

COMBED OR CARDED

COTTON YARNS

In Chains and Skeins, on Balls, Beams, Spools—single or twisted.

The J. R. MONTGOMERY CO.,

WINDSOR LOCKS, CONN.

MERCERIZED EGYPTIAN COTTON SPINNING BANDS.

We claim for them

- They will not shrink nor stretch.
- Are not affected by dry or humid atmosphere.
- Are Fifty per cent. stronger than ordinary bands.
- Will last twice as long.
- Less power required to run spinning.

Mercerized Cotton Yarns which give the High Silk-Like Luster.

Cotton Warps.

WHITTIER COTTON MILLS,
LOWELL, MASS.

THE PHOENIX MILLS CO.,

MANUFACTURERS OF

Fine Worsted Yarns.

Correspondence Solicited. Samples furnished on application.

BOSTON OFFICE: 620 Atlantic Ave. Rooms 10 and 11.

MILLS: 10th & Germantown Ave., Phila. Chester, Pa.

PHILA. OFFICE. No. 13 LETITIA ST.

INDIAN ORCHARD CO.,

Indian Orchard, Mass.

MANUFACTURERS OF

Lustred Cotton Yarns.
In Various Colors and Twists.

NOVELTY YARNS
In Cotton, Silk and Worsted, in various patterns and colors.

Cotton Warps and Yarns
In Gray and all colors, single or 2, 3, 4 and 6-ply, and Cable Cord.

COLORED COTTON
Machined, Carded or in Roving.

(Continued from page 137.)

the spinner his order for yarn. This is the state of the market to-day. Weavers are waiting until after the first of the year before ordering yarn, and the fact of the matter is they do not know what yarn to order in case they were inclined to speculate. The indications point to a demand for yarn from ⅜ to half blood, both for serges and fancies, and the numbers called for will range from 2-28s to 2-30s for men's, and No. 2-36 for dress goods. Good judges say that weavers will miss it again by holding off, because any indication of an active demand for yarn means an increase of from 5 to 7½ cents per pound. The price of yarn to-day is nominal, with concessions made to actual buyers. We hear of one spinner selling 2-36s for .57½ cents, which is 7½ cents cheaper than you can buy others up today. We note that there is some yarn on the market which is being sold for cash by banks which have been involved in recent failures. The price at which this yarn is offered is very low, but the yarn is made up and the sizes are not suitable for the present demand. We had quite recently a very interesting interview with a prominent Philadelphia spinner of fine worsted yarn. This spinner said that he was not anxious to run his mill at the present low prices on fine yarns, because, when his fine Australian wool was used up, he could not replace except at a considerable advance over the present price of yarn. There is no doubt of his position being a sound one, the only "out" about it is that there is practically no demand for fine yarns. This spinner also remarked that he expected to get two cents a pound more than other spinners, on account of the better working qualities of his yarn. The only comment that one would make on this statement is that he will have hard work to convince the average weaver of this fact, especially when trying to meet the prices insisted upon by buyers of cloth. French spun yarn is selling fairly well, as the hosiery manufacturers

(Continued on page 141.)

Colchester Mills,
SPINNERS OF
Made from Colchester Mills Sanitary Random Yarn
Mule Spun Cotton
Hosiery Yarns
Sales in Charge of A. D. SALKELD, 86 & 88 Franklin St., NEW YORK.
Representing B. B. Smalley, Thos. F. Patterson, F. E. Snow
Receivers Colchester Mills.

WOOLEN AND MERINO YARNS.
Special line for Bicycle and Golf Goods in all shades
For Hosiery, Gloves, Underwear, and all kinds Knit Goods. Cop, Cone and Skeins.
The J. & H. Clasgens Co.
New Richmond, O.

WOOLEN YARNS.
All grades Woolen, Mixed and Merino yarns.
15 SETS CARDS.
EDWARD M. ROCKWELL,
LEOMINSTER, - MASS.

A. HERBST. J. W. JONES.
HERBST & JONES,
Successors to Kershaw Worsted Co.
WORSTED YARN SPINNERS,
21st & Naudain Streets,
PHILADELPHIA.

ALBERT R. ELSASSER,
Clifton Worsted Mills.
Lustre Worsted Roving and Yarns
A SPECIALTY.
MILLS: ADDINGHAM, DEL. CO. PA.

C. MOORE & CO.,
MANUFACTURERS OF
TWINES, THREADS AND YARNS.
Jacquard Harness Twines of all kinds on hand and made to order.
S.W. COR. FIFTH & MARKET STS.,
Philadelphia.

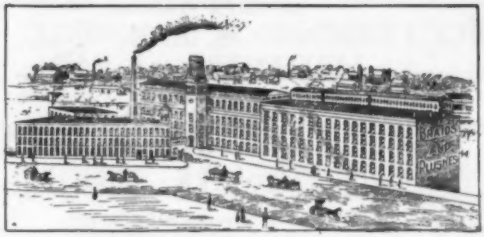
EICHMANN & STERNBERG
530 Broadway cor. Spring St., NEW YORK.
Plain and Gassed Cotton Yarns,
HOSIERY COTTON YARNS,
Mercerized Cotton Yarns. Harness Twines.

COTTON WARPS
White or Colored.
Toweling and Grain Bags.
Dana Warp Mill,
WESTBROOK, MAINE.

HADLEY
SPOOL COTTON AND FINE YARNS COMPANY
COTTON SPINNERS.
MILLS AT HOLYOKE, MASS.

SPINNERS OF
FINE COTTON YARNS
30s TO 100s.
Gray, Bleached, or Colored. On cop, in skein on spools, cones or tubes.
Fine Cotton Warps, single and two-ply, in chain, etc.
Spool Cotton and Seaming Thread.
95 Milk St., BOSTON.

THE WILLIAM CLARK COMPANY,
WESTERLY, R. I.
Mills equipped with the latest and most improved machinery.
Combed Egyptian from No. 20s to 100s. Combed Sea Island from No. 40s to 200s.
Also 2, 3, 4, 5 ply and 6, 9 and 12 plv cable laid.
Hosiery Yarns on Cops Tubes or in Skeins, Grey, Bleached or Dyed. (Fast Colors.



FLYER SPUN
Mohair and Worsted
YARNS.
Mohair Plushes,
Worsted and Cotton Braids.
D. COFF & SONS, Pawtucket, R. I.
ESTABLISHED 1861.

MONUMENT MILLS,
Manufacturers of
White, Colored, Fancy and Double and Twist,
COTTON WARPS
4s to 60s.
HOUSATONIC, MASS.

YARNS
SOLIS : : BOSTON.
179 Devonshire Street.
ANDREW J SOLIS, Jr. & CO.

GREENE & DANIELS MFG. CO.,
COMBED, CARDED AND GASSED
Yarns, Threads, Twines and Chain Warps,
Colored and Bleached Yarns Furnished in any manner desired by the trade.
PAWTUCKET, R.I.

A copy of the Textile World's Directory is presented to every paid-up subscriber of the Textile World, with the compliments of the publishers.

(Continued from page 139.)

and knitters of underwear anticipate a fairly active business next year, and are taking advantage of the present low range of prices.

Woolen Yarn: Spinners are getting some orders for the coming season, and knitters and weavers are beginning to make contracts for next year. The chances point next season toward a good one for the woolen yarn spinners. Buyers are figuring to get lower prices on yarn made from domestic wool. We note that many knitters are lowering their grade of wool, and this policy will later on react upon them. The mills, throughout the knitting section, are fairly busy, and some mills are very busy, either running overtime or else making additions, and are buying new machinery. We note that many of the knitters are putting in garnetting machines with the intention of running much Australian thread waste. Some of the busiest and best equipped mills are manufacturing underwear from this class of stock. All find fault at the small profit, and many are securing only a new dollar for an old one. There can be no doubt that the knitters are doing much better than the weavers.

This is the time when spinners make contracts for next year, and already some good orders have been placed. Much 2-ply yarn will be bought after the first of the year, and it is hoped for the good of the spinners that when orders are placed this year they will not be cancelled, as was the fate of all the orders placed early last year. That policy failed at least one spinner, and buyers will not find as many spinners able to take orders now as was the case last year.

—Skins of animals were probably the first form of clothing after leaves of plants, but woven fabrics of wool and linen came into very early use.

—When cultivated in Eastern climates the rhea fibre is very prolific, and after the first year of planting several crops are obtainable.

Walcott & Campbell Spinning Co,
IROQUOIS MILLS.
FANCY HOSIERY YARNS
IN ALL COLORS.
New York Mills, Oneida Co., N. Y.

BURNET & CO.,
24 George Sq., Glasgow, Scotland.
All numbers and qualities of Cotton Yarns, specialties in
"Silkoline," "Ramie" and Fancies; also bleached filling on long tubes. Turkey reds, etc. A B C Code used. Telegraphic address "Tenrub, Glasgow"

B. F. BOYER & CO.,
Successors to GEORGE SHIMER & BOYER,
HOSIERY YARNS,
In Wool, Merino and Worsted.
GOLF YARNS,
In Wool and Worsted. Also carry a full line
BUNDLE YARNS
For the Jobbing Trade.
MILLS AND OFFICE AT
CAMDEN, - - N. J.

Philadelphia Yarn Market.

The prices on yarns have been continually weakening the past month; although a fair volume of business has been done. The underwear trade has been busy. The stocking trade has generally been dull. Many weavers are very busy. The upholstery trade and the union cloth trade are dull. In fact, everything seems to be dull that has wool or worsted in it.

Some Eastern spinners are very busy, and Southern spinners are generally well sold up.

The high price of two-ply yarns, and the demand for hosiery yarns, particularly on cones, induced a large increase in production of these, which of course has helped to make the market weak. This has also been largely induced, however, by the price of the staple. It is generally thought, however, that the next, or 1899, crop of cotton will be a small one, which will of course stiffen the market up and

(Continued on page 143.)

HOWLAND CROFT, SONS & CO.

LINDEN WORSTED MILLS.

Fine Worsted Yarns

OFFICE AND MILLS:

Broadway and Jefferson Ave., Camden, N. J.

Represented by FIRTH BROADHEAD,
937 Banigan Building, Providence, R. I.

ALLEGHENY WORSTED MILLS,

Thomas Wolstenholme, Sons & Co., MANFRS. OF

Worsted YARNS,

ALL NUMBERS SINGLE AND TWO-PLY,

Sell Direct,

on Cop or in Skein, for Weaving and Knitting Purposes, in White, Natural & Fancy Mixes.

Office and Mills: Frankford Ave. and Westmoreland St., Phila., Pa.

CRANSTON WORSTED MILLS.

Worsted and Mohair Yarns—white or colors, in skeins, on spools, cones, or shuttle bobbins.

NOVELTY YARNS—of Mohair and Worsted. We are the only manufacturers in the United States making these yarns from the raw material to finished product and making Yarns only.

CENAPPED YARNS of all kinds. Doup Yarns. Harness Yarns for Braids, etc.

BRISTOL, R. I.

George Campbell & Co.

Worsted Spinners.

Yarns, both French System and Bradford.

Knitting Yarns in all Grades and Mixes.
All Numbers to 60s.

21ST STREET AND WASHINGTON AVENUE, PHILADELPHIA.

MALCOLM MILLS CO.,

MANUFACTURERS OF

Novelty Yarns, Silk Noil Yarns, in Fast Colors AND White.

Mills, Frankford, Pa. Office, 229 CHESTNUT ST., PHILA.

(Continued from page 141.)

probably cause a considerable advance next Spring. We quote:

Warps:

20/1	12
22s	12½
26s	12½ to 13
12/2	12
14/2	12 to 12½
16/2	12½
20/2	12¾ to 13
30/2	14½ to 15
40/2	19½ to 21½

Skein:

26/1	12
20s soft	12
19s soft	12
4s to 10s soft	10 to 10½
12s soft	10½ to 11
12/2	10¾ to 11
14/2	11
20/2	12½
30/2	14 to 14½
40/2	19 to 20
8/3 hard	10
16/3 slack	11 to 11¼
16/4 medium	11 to 11¼
16/2 slack	11 to 11¼

Southern cones (various qualities).

6s to 8s	11½ to 12
10s	11¾ to 12½
12s	12¼ to 12½
14s	13 to 13½
16s	13½ to 14
20s	14 to 15
22s	14 to 15
24s	14½ to 15½
30s	16
26s	15 to 15½

Shuttle Cops:

6s to 8s	11½ to 11¾
12s	11½ to 12
16s	12 to 12½
26s	12 to 12½
40s	16 to 17

Mixed Colored cones:

6s to 8s	13
10s	13¼ to 13½
12s	14
14s	14½
16s	14½ to 14¾

Eastern Cops:

10s hosiery	12½
14s "	13½
16s "	13½ to 14
20s "	15
10s shuttle	12 to 13
14s "	12½ to 13

Eastern skein ½ cent above cops.

Eastern cones ½ to 1¾ cents above cops.

Egyptian yarn 4 to 5 cents above white.

Combed yarn 4 to 5 cents above carded.

Woolen and worsted trade still very dull. Prices are low, and about as last month.

We quote wool spun cotton yarn as follows:

20 cut black cops	12½ to 13
26s	15 to 15½
12s to 16s	12 to 12½

Other colors about the same price. 13 cut skein, 10 to 10½c.

—In the care of reeds and harness little need be said. Not much will be gained in revarnishing harness during their use unless it is done after each warp or two, and it is doubtful if that will pay. When harness are to be laid away and not used for a time, they should be kept in a room with moderate temperature, and no grease or other substance put on them. Reeds are often spoiled by being kept either open or in boxes in a damp place where steam or moisture can reach them. The keeping in a dry place is the only protection they need.

—In Japan the matting manufacturers use a straw, like the Chinese, from which they make what is called the Bungo weave.

—The ring frame has made great progress, and has proved itself well adapted to the spinning of low and medium counts.

SILK NOILS AND SILK NOIL YARNS
IN WHITE AND COLORS.
MOHAIR LOOPS, KNOTS, AND FANCY YARNS FOR DRESS GOODS AND CLOAKINGS.
A. T. SKERRY & CO., 47 LEONARD ST., NEW YORK.

CHENEY BROTHERS,

SILK MANUFACTURERS.

ALL KINDS OF

Knitting Silks, Ribbons AND Piece Silks,

USED FOR TRIMMING KNIT GOODS.

TRAMS, ORGANZINES and SPUN SILKS, in the Hank, or on Spools or Cones, for Manufacturers' Use. Silk for Special Purposes Made to Order.

MILLS: South Manchester and Hartford, Conn.

SALESROOMS: 477, 479 and 481 Broome Street, NEW YORK.
929 Chestnut St., PHILADELPHIA.
79 Chauncy Street, BOSTON.
186 Franklin Street, CHICAGO.

WILLIAM RYLE & CO.,

DEALERS IN

Domestic Thrown Silk of every description. Fine Pure Dye Silks for the woolen trade a specialty. Foreign and domestic

SPUN SILK YARNS AND NOILS

Importers of European and Asiatic Raw Silk.

54 Howard St., cor. Mercer St., - NEW YORK.

C. J. LITTLEWOOD & SONS, Ltd.

ALBION

DYE and BLEACH WORKS,

MANAYUNK, PA.

DYERS of Cotton, Cotton Yarns, Wool and Raw Stock Generally. **BLEACHERS** of Cotton and Cotton Yarn.

CITY OFFICE: 132 Chestnut Street.
PHILADELPHIA.

Telephone Connection,
MAIN OFFICE AT THE WORKS.

[PATENT APPLIED FOR]

IRONPHALT ROOFING

Guaranteed for 6 years when applied as per our specifications.

Is the most permanent covering for all kind of buildings, Ready for application. Write for samples and compare with other roofings.

Catalogue Free.

SPECIALTIES: 2 and 3 Ply Roofing, Insulating, Building and Sheathing Papers, Asphaltum, Pitch, Roof Paints, etc.

ARMITAGE MFG. CO., Richmond, Va.

PROVIDENCE DYE WORKS.

Dyers and Finishers,

COTTON YARNS, Suited for HOSIERY and WEAVING Cotton, Woolen and Worsted DRESS GOODS, Woolen and Worsted Mixed CASSIMERES and CLOAKINGS, also Woolen and Worsted Slubbing, COTTON YARN and WARP DYERS and BLEACHERS.

FIRTH & FOSTER CO.,

OFFICES: **Philadelphia, 346 Bourse Building.**
New York Office, Silk Exchange, Broadway and Broome St.
WORKS: **Taylor, Emerald and Adams St., Kensington, Philadelphia, Pa.**

Boston Finishing Works

WILLIAMSTOWN, MASS.

BLEACHERS, DYERS AND FINISHERS

Of Pure Finish Shirtings, Sheetings, Canton Flannels and Filled Good Also Silesias, Satteens, Corset Jeans, Cambrics, Sleeve Linings, Pocketings, Flanneletts, and all descriptions of Dyed Goods.

NAPPING A SPECIALTY.

Being equipped with the French and other Foreign and Domestic Napping Machines we are prepared to give any kind of Nap required, including the French FlannelFinish.

R. GREENWOOD & BAULT,

GLOBE DYE AND BLEACH WORKS,

FRANKFORD, - PHILADELPHIA.

Specialists in Cotton Warps and Skein Dyeing.

HOME BLEACH AND DYE WORKS,

PETER B. McMANUS, Proprietor.

Dyers and Bleachers of Cotton Yarns,

PAWTUCKET, R. I.

Pawtucket Dyeing & Bleaching Co.,

BLEACHERS AND DYERS OF

COTTON YARNS AND STOCKINET.

OFFICE WITH BLODGETT & ORSWELL CO., Manufacturers of Glazed Yarns,
28 BAYLEY ST. PAWTUCKET, R. I.

COCHRANE CHEMICAL CO.,

50 Kilby St., Boston, Mass.,

MANUFACTURERS OF

ACIDS, AMMONIAS, ALUMS, SODAS

And other Chemicals.

FAST COLORS

For Wool, Woolen and Cotton Yarn and Piece Goods Dyeing, and for Calico Printing

ALIZARINE RED, PASTE AND POWDER.

Alizarine Blues, Oranges, Browns, Yellows, Maroon, Gray and Black.
Cœruleine, Galleine, Mythylene Grays.
Thionine Blues, Thionine Indigo, Solid Green and
PATENT BLUES (superseding Extracts of Indigo on account of fastness and color bloom) for Wool and Silk, Benzidine and Primuline Colors, Zinc Dust, Aniline Salts and Oil.

VICTOR KOECHL & CO. 122 HUDSON ST., NEW YORK.

SOLE AGENTS FOR

FARBWERKE, formerly MEISTER, LUCIUS & BRUENING, HOECHST o | M.; A. LEONHARDT & CO., Muehlheim o | M.

BRANCH OFFICES:

Boston, Mass., 138 Milk St.; Philadelphia, Pa., 39 N. Front St.; Providence, 45 S. Main St.

New York and Boston Dyewood Company,

MANUFACTURERS OF

DYEWOOD EXTRACTS.

Sole Agents for the United States and Canada for
ACTIEN-GESELLSCHAFT FUR ANILIN-FABRIKATION, BERLIN.
Specialties for Wool, Silk and Cotton.

BENZO PURPURINE B, 4 B, 6 B; BRILLIANT PURPURINE R; BRILLIANT CONGO R, etc.
CHROME FAST BLACK B, a new fast black for wool.

NEW YORK: 55 BEEKMAN ST. PHILADELPHIA: 124 ARCH ST.
BOSTON: 117 HIGH ST. HAMILTON, ONTARIO.

Established 1834. H. G. JOHNSON, Proprietor.

Wm. G. Johnson Co.

Manufacturers of

DYEWOODS

Logwood Extracts,
Ground and Bolted Camwoods
And other Fancy Woods.

All Goods Warranted Uniform.

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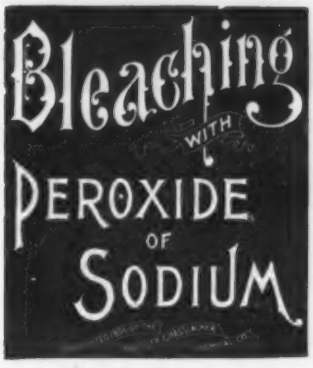

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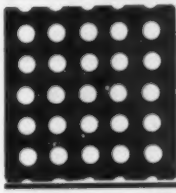

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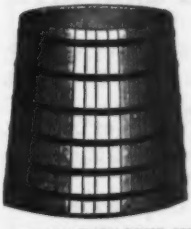

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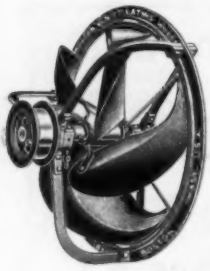

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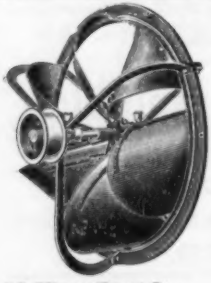

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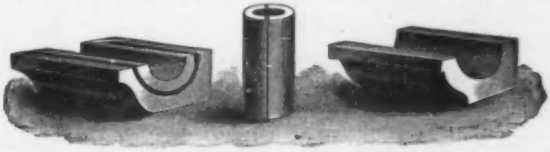

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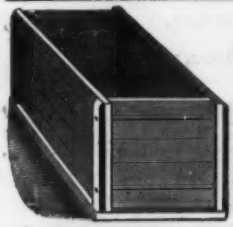

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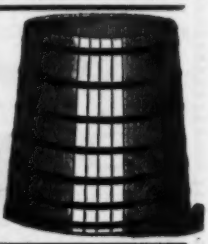

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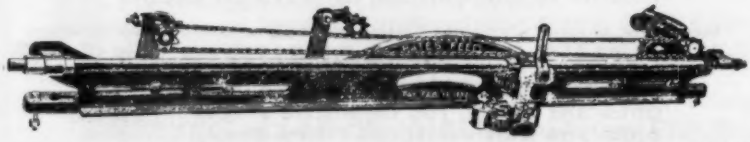

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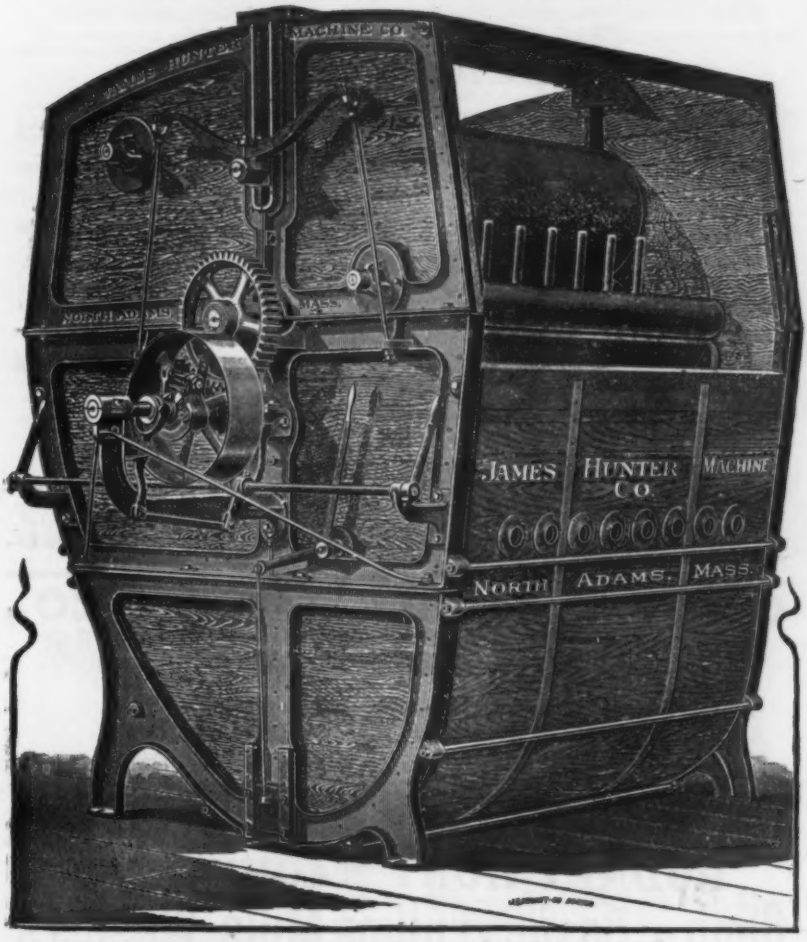

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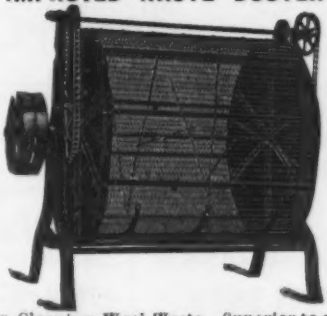

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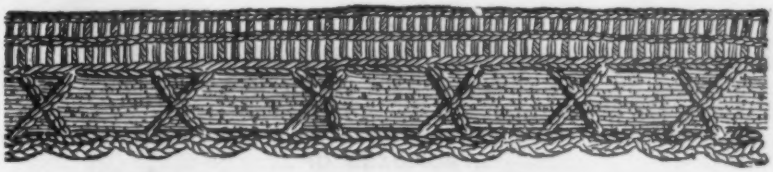

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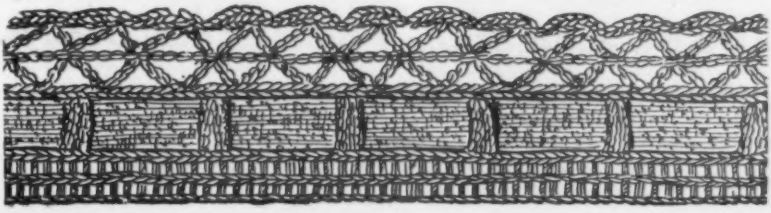

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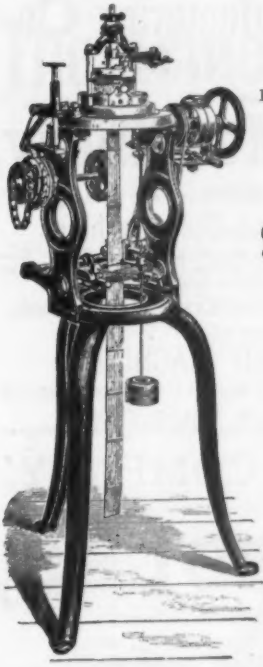

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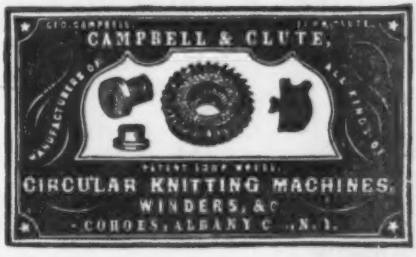

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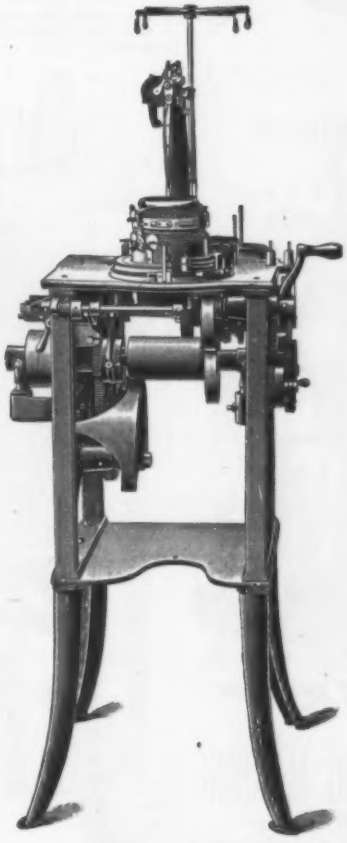

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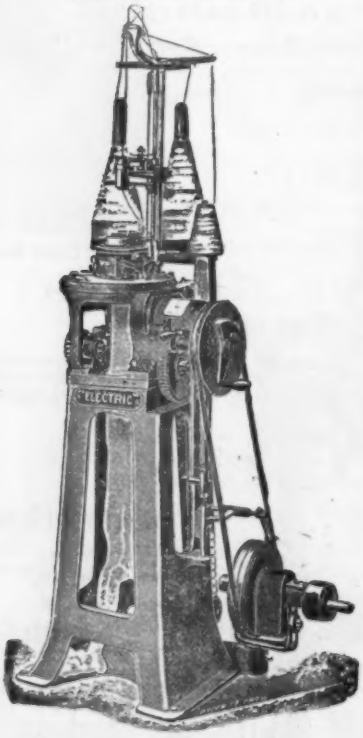

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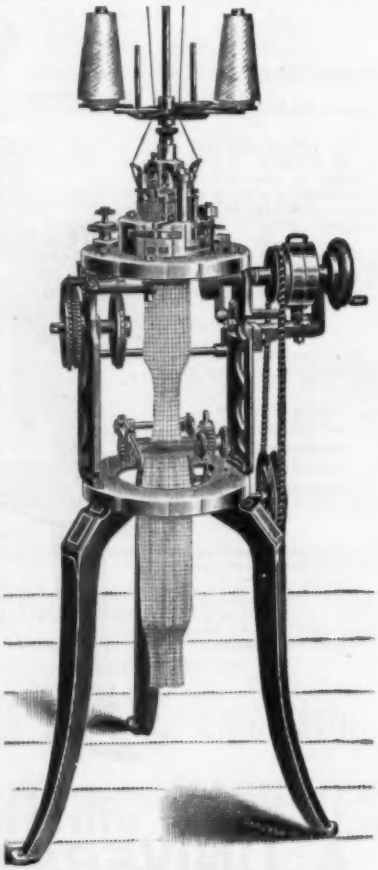

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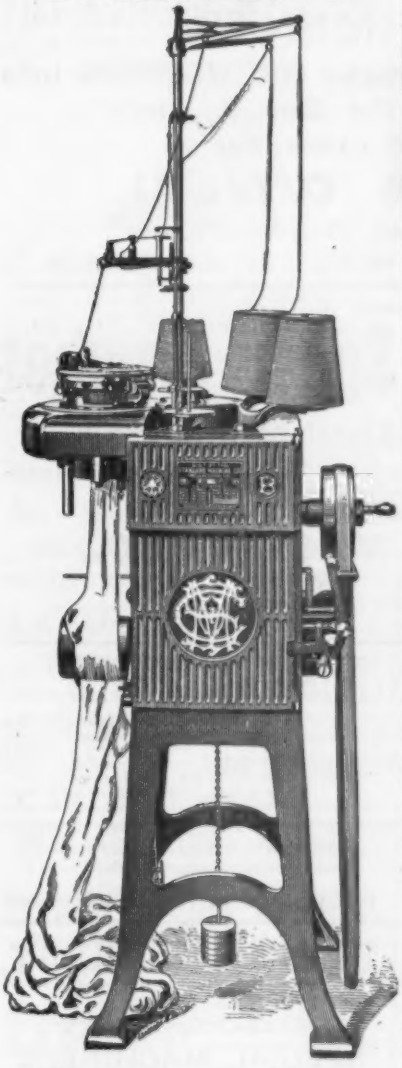

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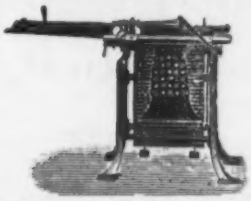

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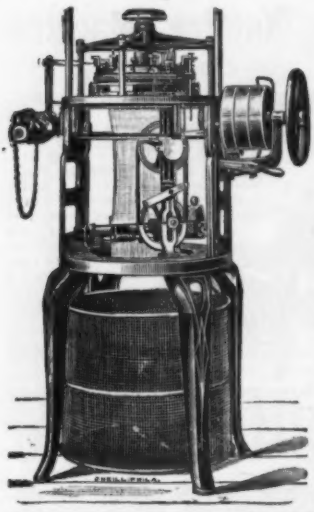

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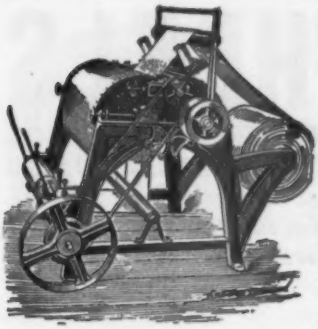

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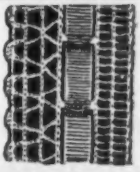

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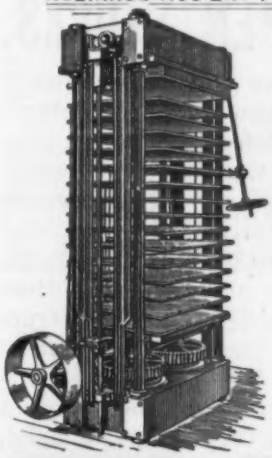

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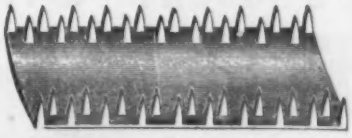

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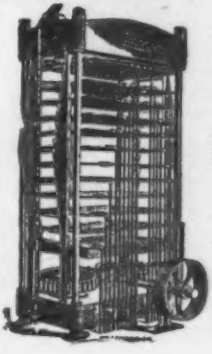

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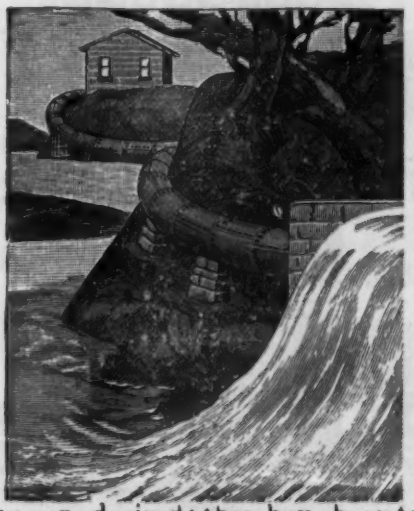

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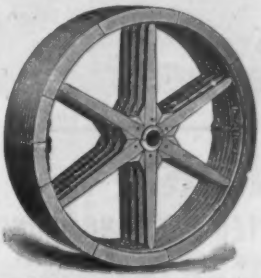

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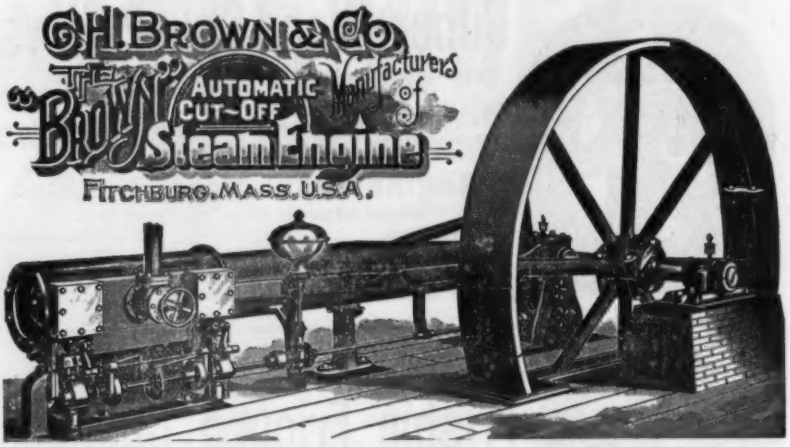

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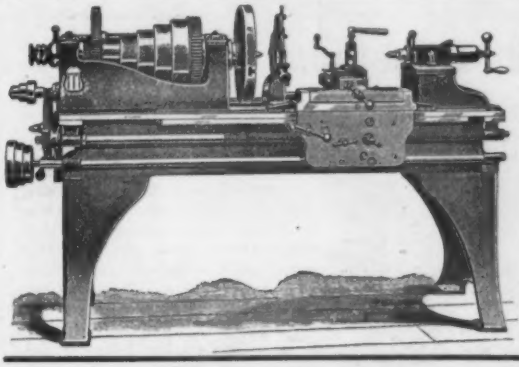

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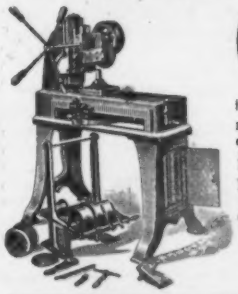

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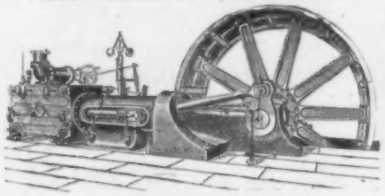

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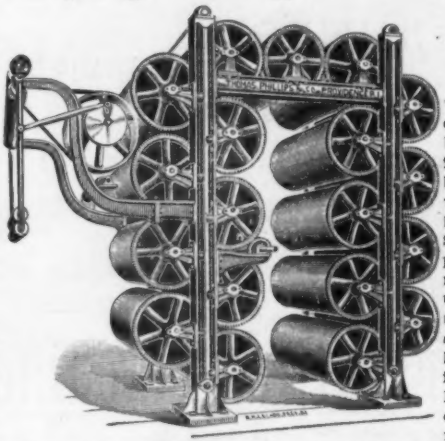

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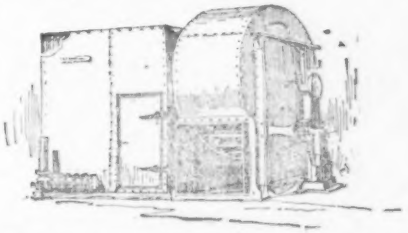

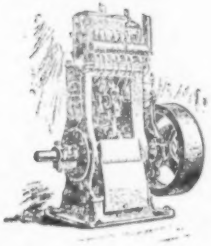

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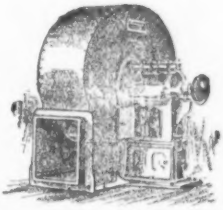

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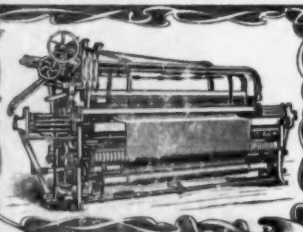

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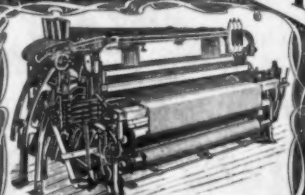

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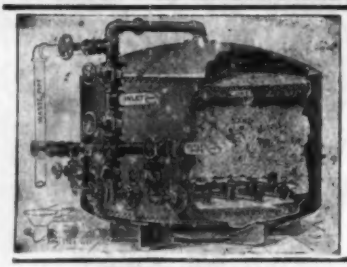

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